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ABSTRACT

This study was conducted to explore the retentive effects of vocational education and the labor market effects of vocational education and dropping out of high school. Data were gathered from the New Youth Cohort of the National Longitudinal Surveys of Labor Force Behavior (NLS Youth) supplemented by high school transcripts. An explanatory model of high school retention and labor market effects was developed that provided the framework for the analyses. The model included five major categories of predictive variables: individual, family, contextual, school characteristics, and high school experiences. Analyses to determine the retentive effects of vocational education focused on the high probability group of students most likely to leave high school without graduating. It was found that the more vocational education students had taken, the less likely they were to drop out of school. This relationship was significant for grades 10 and 12, but negative and insignificant for grade 11. The size of the effect, however, was small. The study also found that participation in vocational education, when combined with completion of high school, appeared to prevent some unemployment compared to the extent of unemployment experienced by dropouts. This relationship was greater for females than for males. Implications of the study included recommendations concerning possible intervention strategies, the federal leadership role, and areas in need of further research. (KC)

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VOCATIONAL EDUCATION AND THE HIGH SCHOOL DROPOUT

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FOREWORD

Dropping out of high school has important implications for individuals, as well as for society as a whole. Individuals who do not complete high school are likely to have a more negative labor market experience than graduates, especially in terms of unemployment. The societal impact includes foregone tax dollars, and possibly increased welfare and prison expenses. Vocational education represents a potential strategy for increasing the relevancy of education for dropout-prone youth, and thus a means of encouraging them to complete their high school education.

The present study used the New Youth Cohort of the National Longitudinal Surveys of Labor Force Behavior (NLS Youth) data base to explore the retentive effects of vocational education and the labor market effects of vocational education and dropping out of high school. The NLS Youth surveys were developed by the Center for Human Resource Research (CHRR) at The Ohio State University, with support from the U.S. Departments of Labor and Defense. Michael Borus, Director of CHRR, and two of his staff members, Susan Carpenter and Michael Motto, served as consultants to this project, offering valuable advice concerning the analysis of the data base.

Definition of high school curriculum was accomplished with greater precision than was previously possible due to the availability of high school transcripts for the NLS Youth respondents. With funding for the project by the U.S. Department of Education, Office of Vocational and Adult Education, the National Center for Research in Vocational Education contracted with the National Opinion Research Center (NORC) to collect the transcripts. The present study was also funded by the U.S. Department of Education, Office of Vocational and Adult Education.

This study was conducted in the Evaluation and Policy Division of the National Center for Research in Vocational Education, The Ohio State University. Jill Russell assisted in the early stages of the literature review, and Marta Fisch provided computer programming support in the analysis stage. Project Director Donna M. Mertens, as well as Patricia Seitz, Morgan Lewis, and Sterling Cox, staffed the project from its initial conceptualization to the completion of the final report. Expert clerical support was provided by Deborah Anthony.

The quality of the report was enhanced by the comments of several reviewers. National Center staff members who reviewed the initial draft included N. L. McCaslin, James Weber, Louise Vetter, and Larry Hotchkiss. In addition, Russell Rumberger, Research Associate at the Institute for Research on Educational Finance and Governance, Stanford University, and Jerald Bachman,

Program Director of the University of Michigan's Institute for Social Research, provided insightful reviews. Final edit of the document was provided by Constance Faddis of the National Center's editorial staff.

Robert E. Taylor
Executive Director
National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

For more than a century, proponents of vocational education have claimed that it provides a practical alternative to students who are bored and frustrated by an academic curriculum. Methodological problems have plagued previous research to determine if vocational education has a retentive effect on high school youth who might otherwise drop out. The present study used the New Youth Cohort of the National Longitudinal Surveys of Labor Force Behavior (NLS Youth) in an attempt to untangle the many interrelated influences and determine the independent effects of taking vocational courses on retention. In addition, the study explored the labor market effects associated with participating in vocational education and dropping out of high school.

The NLS Youth Cohort is a nationally representative sample of 12,686 young people who were fourteen to twenty-one years old in 1978. Their 1979 and 1980 interviews, supplemented by high school transcript data, provided the data for the current study.

An explanatory model of high school retention and labor market effects was developed that provided the conceptual framework for the analyses. The model included five major categories of predictive variables:

1. Individual (e.g., self-esteem, participation in illegal activities)

2. Family (e.g., mother worked for pay, socioeconomic status)

3. Contextual (e.g., percent of county employed in manufacturing, county unemployment rate)

4. School characteristics (e.g., availability of vocational education, percent of disadvantaged students in the school)

5. High school experience (e.g., participation in vocational education, days absent)

Retentive Effects of Vocational Education

Ordinary least square (OLS) regression analysis was used to partition the sample into two groups--one with a high probability of dropping out and one with a low probability. Analyses to determine the retentive effects of vocational education focused on the high probability group, i.e., those most likely to leave high school without graduating. Separate OLS and probit regression analyses were used to determine the effects on completion of

the next grade level of taking vocational education in grades nine, ten, and eleven, while controlling for the individual, family, contextual, school, and high school experience variables.

Based on regression results for the high probability group, the vocational education coefficient always had the expected relationship with dropping out of high school. All else being equal, the more vocational education students had taken, the less likely they were to drop out of school. This relationship was statistically significant in grades ten and twelve, and negative but not significant for grade eleven. Although the relationship was significant for grades ten and twelve, the size of the effect was small. In both grades ten and twelve, obtaining one vocational credit was associated with about a tenth of a percent reduction in the probability of dropping out.

Several hypotheses were explored to examine the meaning of these results. One possible scenario concerned the age of the students and the availability of vocational education. Ninth grade vocational education may have helped retain students in the tenth grade because it offered them an alternative to an irrelevant academic curriculum, and the majority of the students were young and not yet feeling financial pressure. Tenth grade vocational education may not have had this strong retentive effect because the majority of the individuals had reached the legal age for leaving school and were starting to feel pressure to work and make money. In addition, most vocational education programs did not become available to students until the eleventh and twelfth grades. It could have been that the limited vocational offerings available in the tenth grade were not a strong enough influence to overcome the legal age and financial pressures felt at that time. Eleventh grade vocational education may have had a significant retentive effect for grade twelve because of the greater variety of vocational offerings that were available in grade eleven.

All major components of the explanatory model, except contextual variables, contained elements that were significantly related to dropping out of high school. It was not clear why the contextual variables were not significant, as they had been found to be so by other researchers. The many independent variables related to dropping out of high school served to emphasize the complexity of this issue.

Labor Market Effects of Vocational Education and Dropping Out of High School

Regression analysis was also used to examine the effects of vocational education, dropping out of high school, and the interaction of these two elements on labor market experiences. The

explanatory model appeared to be adequate for describing these labor market effects.

The interaction of vocational education and dropping out of school had a significant effect on decreasing job satisfaction for females. Based on OLS, this interaction was significantly associated with a reduction in unemployment. However, the results of the probit analysis did not confirm this finding. It did not have a significant effect on any of the other labor market variables for females, and its effect did not appear to be significant for males on any of the labor market variables.

Increases in participation in vocational education for all females were significantly associated with holding jobs with higher occupational prestige, lower unemployment at the time of the interview, higher training-related placement, and lower weeks of unemployment in the year between interviews. For all males, vocational education was significantly related to higher occupational prestige, higher job satisfaction, greater training-related placement, more hours worked per week, and higher weekly wages. Other than the nonsignificant earnings effects for females, the findings were generally in line with those reported by other researchers (Campbell et al. 1981; Grasso and Shea 1979; Mertens and Gardner 1981). In other studies, females were reported to have earned more per hour if they had exactly twelve years of education and graduated from a business and office program. These differences may have been accounted for by the fact that vocational program areas were not included in these analyses, and, that postsecondary experiences were controlled by inclusion of the variable "number of years of school." For males, the relationship between higher occupational prestige and vocational participation has not been consistently reported by other researchers.

Based on OLS analyses, dropping out of high school was associated with significantly higher unemployment rates for both sexes. Probit analysis confirms this effect for males, but not for females. Female dropouts also experienced a significantly lower hourly rate of pay. Male dropouts experienced significantly more weeks of unemployment and worked fewer hours per week. Unemployment was the most consistently mentioned problem for the dropout (King 1978; O'Malley et al. 1977; U.S. Department of Labor 1981).

Other personal and contextual variables had significant relationships with labor market variables. Being black, living in a rural area, or having low self-esteem had a consistently depressing effect on the labor market indicators for both sexes, while being older and living in the West had the opposite effect. Other personal variables that consistently influenced females, but not males, included early marriage, late childbearing, involvement with drugs, and being Hispanic. Males appeared to have

benefited more from living in a community with a high percentage of manufacturing, and to have experienced more involvement with the criminal justice system.

Implications

The results of the present study provided evidence that participation in vocational education was influential in preventing high school dropout. Although the size of the effects was small, these findings corroborated those of previous researchers. In addition, participation in vocational education, when combined with completion of high school, appears to influence the one most consistently reported problem of dropouts, i.e., unemployment. Although the size of the effect was small, females with vocational training had significantly lower unemployment rates than their peers without vocational training; for vocational males the rates were also lower, but not significantly so.

Other implications of the study included recommendations concerning possible intervention strategies, the federal leadership role, and areas in need of further research. One possible intervention strategy would be to increase the availability of vocational education below eleventh grade. The federal government could provide leadership by supporting research, practices, and technical assistance for the purpose of improving the educational and employment experiences of youth most likely to drop out of school. Future research could include examination of the relationship between OLS and probit regression analysis, the role that vocational education plays in the dynamics of dropout processes, the effectiveness of various intervention strategies, and the direction of causality for self-esteem and criminal activities as they relate to dropping out of school.

CHAPTER I

INTRODUCTION

By 1823, two years after the opening of the first publicly supported high school in America, 76 of the entering class of 176 had dropped out. The School Committee of the City of Boston, in response to this high attrition, recommended that the most useful and practical subjects should be offered in the first year (Stephens and VanTil 1972). The use of occupationally relevant instruction to prevent high school dropout had begun. Unfortunately, how well this instructional change was implemented, or if the change helped to keep students in school, was never documented. Things have not changed a great deal in the past 150 years. Relevant education is repeatedly urged as a way to reach and retain poorly performing youth in school, but the utility of this approach has yet to be clearly demonstrated.

The economic and social consequences of dropping out emphasize the need for a better understanding of the dropout phenomenon. High school dropouts can expect to earn less than graduates over their lifetimes. Jones (1977) reported the results of the Select Senate Committee on Equal Educational Opportunity's study entitled "The Effects of Dropping Out." The study assessed the loss to the nation in 1969 associated with twenty-five to thirty-four-year-old males who had not completed high school. The study estimated that the lost income was $71 billion in foregone government revenue--$47 billion to the federal government and $24 billion to local governments. The welfare expenditure attributed to inadequate education was an additional $3 billion a year. In contrast, it would have cost $40 billion to have had men aged twenty-five to thirty-four complete high school.

A greater amount of criminal activity is also associated with dropping out of high school (Novak and Dougherty 1979). Police statistics indicated that dropouts are six to ten times more likely to be involved in crime than in-school students (Jones 1977). About 85 percent of the inmates in state prisons are school dropouts (O'Morrow 1976). The cause and effect relationship between dropping out and criminal activity cannot be assumed, and indeed, longitudinal data presented by Bachman, Green, and Wirtanen (1971) raised basic questions about the relationship. However, criminal behavior might be reduced if potential dropouts were retained in school.

Analytic Problems

There are two basic problems in attempting to assess the effects of secondary-level vocational courses on retention. The first is self-selection of courses of study by students. The

second is that many young people drop out before they have had a chance to participate in vocational courses. Furthermore, many of the characteristics associated with taking vocational courses are also associated with the decision not to complete high school.

Coming from low income families and performing poorly on standard achievement tests, for example, are personal factors associated both with taking more vocational courses and with withdrawing from school. Often, however, students withdraw before they take any vocational courses. As a result, it is extremely difficult to determine the effect of vocational participation for those students who are similar to dropouts but who continue in school long enough to take at least a few vocational courses. Do they continue because they take vocational courses, or do they continue and participate in vocational courses because of other factors? This study attempts to untangle the many interrelated influences to determine the independent effects of vocational courses on retention. In addition, the study explores the labor market effects associated with vocational education and dropping out of school.

Previous research results prevent definitive conclusions about dropout rates of students in different curricula for a number of reasons that have been discussed in other publications (Mertens et al. 1980; National Institute of Education 1981; Woods and Haney 1981). A brief review of some of these problems is presented here.

A number of researchers have used national data bases to examine the effects of vocational education on high school completion. Coombs and Cooley (1968) used Project TALENT data collected in 1960 and 1964 to determine curriculum effects. Self-report of curriculum at two time points was used: (1) curriculum in which the ninth graders planned to enroll, and (2) actual curriculum membership at the time of leaving or graduating from high school. These self-reports were compared for dropouts and a random subsample from the ninth grade cohort who graduated and who reported, in the 1964 survey, that they had not entered a junior or four-year college. The comparison group provided norms for evaluating shifts among curricula between the expected curriculum in grade nine and the actual curriculum at graduation. The authors reasoned that if there were no associations between the students' curricula and their dropping out, then the rise or decline in the percentages in each curriculum between the two time points for those who had dropped out by the anticipated time of graduation should parallel those for the comparison group of graduates. The comparison of the patterns between the two time points suggested that only the general curriculum was associated with a greater probability of dropping out.

As Woods and Haney (1981) noted, the comparison group used by Coombs and Cooley did not provide an adequate control for the net flow of students into the vocational curriculum that occurs as students progress through high school. Since vocational programs are frequently available only in the eleventh and twelfth grades, the distribution of the comparison group at the time of graduation should show the end result of this net flow. The dropouts should include individuals who have left school at various points in time between grades nine and twelve, and thus should include those who never had an opportunity to be classified as vocational students.

Grasso and Shea (1979) used the National Longitudinal Surveys of Labor Market Experience (NLS Boys and Girls) data that had been collected between 1966 and 1973 to examine this issue. They reported that both cross-sectional and longitudinal analyses revealed a positive retention effect for vocationally enrolled females. Their results for males were mixed; i.e., longitudinal data analysis suggested that the vocational males were more likely to drop out than their general peers, whereas the results of cross-sectional analysis suggested the opposite. The cross-sectional analysis controlled for scholastic aptitude, socioeconomic status (SES), and residence, and indicated that for those who completed at least ten years of school, vocational studies may have raised the probability of completing twelfth grade. However, the NLS Boys and Girls data revealed that between the ninth and twelfth grades, some students moved from one curriculum to another, with a net increase in vocational enrollments from one year to the next. This "net flow" toward vocational studies for those who stayed in school contributed to a positive association between enrollment in a vocational program and grades completed in high school. This shift also imparted a positive bias to any cross-sectional regression results linking most recent curriculum to highest year of school completed (through grade twelve).

Woods and Haney (1981) used cross-sectional data from the National Longitudinal Surveys of Labor Market Experience (NLS Youth) that were collected in 1979 to examine this issue. They reported higher dropout rates for general than for vocational curriculum participants. The authors suggested that their results be viewed with caution because of two major sources of bias in their cross-sectional analysis. First, cross-sectional approaches to estimating dropout rates based on a school-age population tended to underestimate actual dropout rates, due to the fact that some of the youth counted as in-school may still have dropped out before completing high school. Second, depending on the transfer pattern among curricula, cross-sectional approaches may have yielded biased estimates of relative curriculum dropout rates.

The current study examines this problem with a statistical analysis of a set of longitudinal data, the New Youth Cohort of the National Longitudinal Surveys of Labor Market Experience (NLS Youth). This Cohort includes a nationally representative sample of 12,686 young people who were fourteen to twenty-one years old when first interviewed in 1979. Subsequent interviews were conducted in 1980, 1981, and 1982. High school transcripts were available for approximately 7,500 of that sample who were seventeen or older in 1981.

This study differs from previous research in several ways. First, the most currently available data were used, i.e., the 1979 and 1980 interview data for the NLS Youth. Second, the respondents' curricula were determined based on their high school transcripts. Thus, the researchers were able to determine the documented number of credits actually obtained in vocational education. Previous research indicated a considerable discrepancy between self-report of curriculum and actual courses taken (Campbell, Orth, and Seitz 1981). Third, the method of analysis simulated a longitudinal approach, thus providing more control of the "net flow" problem that plagued earlier research. Regression analyses were conducted for separate samples determined by highest grade completed, i.e., the effect of having taken vocational courses on completion of the tenth grade was examined for those who completed the ninth grade. Subsequently, the effect of curriculum on completion of eleventh grade was examined for those who have completed tenth grade. Finally, this effect on completion of twelfth grade was examined for those who completed eleventh grade. More detail concerning the method of analysis is provided in the next chapter.

Explanatory Model of Factors Influencing High School Completion and Labor Market Outcomes

While research about the effects of vocational education on high school completion has been scarce, research about other factors associated with high school dropout and labor market outcomes has been abundant. In order to organize the many factors that have been cited in the literature, an explanatory model has been constructed (see figure 1). This model represents a synthesis of factors that have appeared in the literature concerning the effects of education on achievement, high school completion, and labor market effects.

Averch et al. (1974), Bridge, Judd, and Moock (1979), and Walberg (1981) each proposed different production functions to explain educational outcomes. Averch et al. suggested that educational outcomes are dependent upon school resources (e.g., the teacher's abilities), the student's background (e.g., family income), and the characteristics of peers (e.g., percent minority). Bridge, Judd, and Moock proposed five classes of factors:

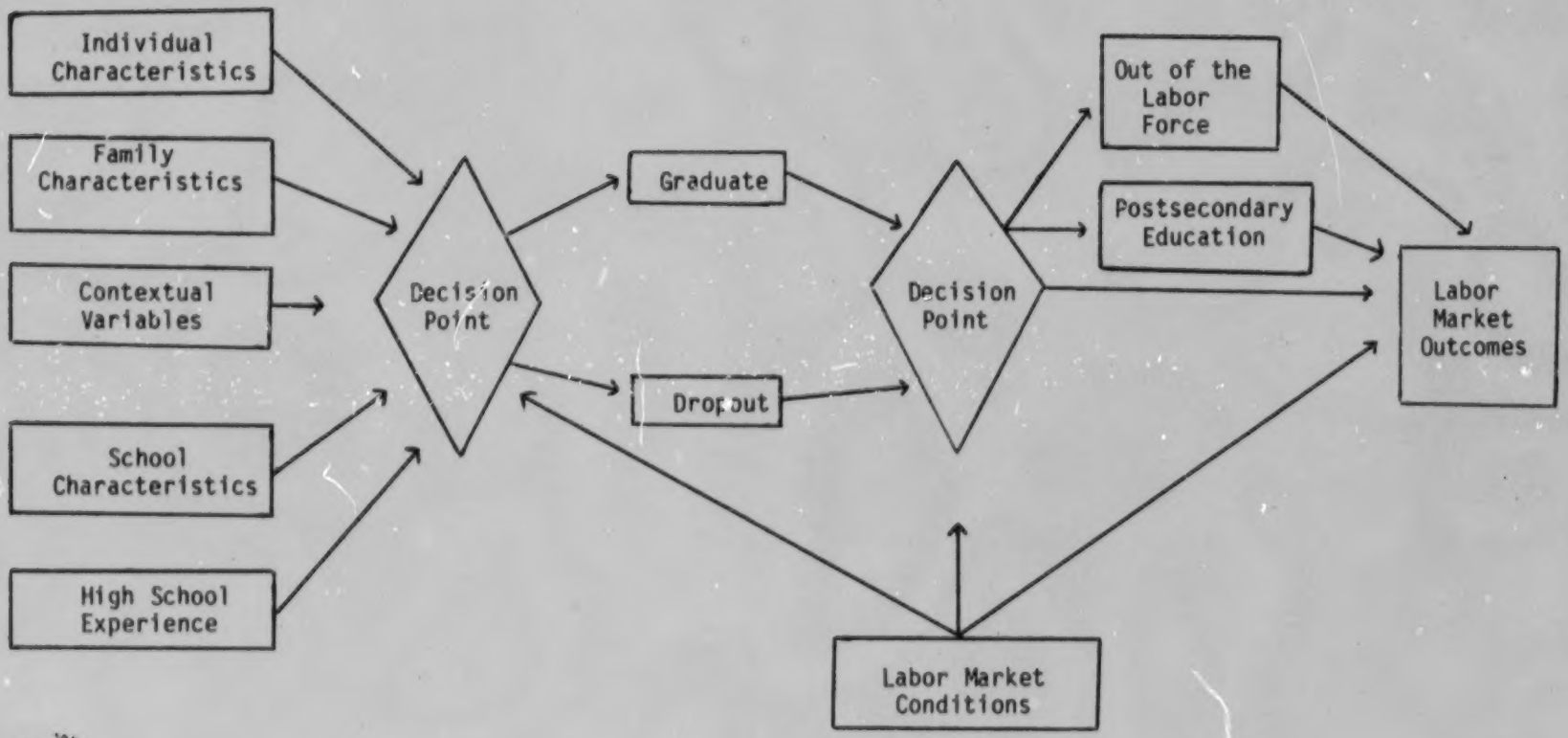

Figure 1. Explanatory model of factors influencing high school completion and labor market outcomes

individual student inputs, family inputs, peer group inputs, teacher inputs, and school inputs. Walberg's model included an individual's aptitude, teacher characteristics, and the environment of the home, classroom, and school.

Research findings on factors associated with high school completion were used to refine the conceptual model that has been developed in the present study. In a study of the basic skill levels of high school dropouts, Weber et al. (1982) categorized the prototypical characteristics of potential dropouts as cognitive factors (e.g., academically below average), affective factors (e.g., low self-esteem), and other factors (e.g., low SES). Grasso and Shea (1979) proposed a model of educational attainment that included SES, residence at age fourteen, scholastic aptitude, high school curriculum, and educational aspirations. Based on a study using the NLS Youth data base, Rumberger (1981) identified a number of variables significantly associated with dropping out. These included family background (e.g., mother's education), residence, and contextual factors (e.g., community unemployment rate).

The final body of literature that contributed to the refinement of the model was that related to the labor market effects of education. Grasso and Shea (1979) examined earnings and employment effects of individuals with exactly twelve years of schooling. They controlled for such variables as scholastic aptitude, socioeconomic origins, years of work experience, residence, and whether the respondents received some form of postsecondary training. The labor market effects portion of the model has been most heavily influenced by the work reported by Campbell et al. (1981) and Mertens and Gardner (1981). Both of these studies included explanatory models of the variables influencing labor market behavior. As the focus of the studies was on the effects of vocational education on labor market outcomes, the models did not address directly the decision point of high school graduation. However, the integration of the models described previously has resulted in a model that has been used to guide the analyses in the present study.

Variables Associated with Dropping Out of High School

Once the major components of the model had been identified, the literature was reviewed to determine the variables that had been associated with each component. The order of presentation conforms to that found in the model, i.e., individual characteristics, family characteristics, contextual variables, school characteristics, and high school experience.

Individual Characteristics

High school dropouts, like members of any other subpopulation, possess certain characteristics by which they may be identified. The establishment of clear-cut cause and effect relationships between such characteristics and the phenomenon of dropping out is seldom, if ever, accomplished. The relative consistency in the manifestation of the characteristics reveal patterns that can lead to the identification of potential dropouts. In this section, the demographic, affective, and cognitive characteristics of dropouts are discussed.

Demographic characteristics. Previous studies of dropouts and the dropout phenomenon provide a rich source of information about the demographic characteristics that distinguish dropouts from graduates. There are many such characteristics upon which these studies may focus. Those that have received some attention include (1) age (Larter and Cheng 1979; Lloyd 1978; Watson 1976;) (2) criminal record (National Advisory Council 1975); (3) grade level (Resta and Temple 1978); (4) marital status (Grasso and Shea 1979; Novak and Dougherty 1979); (5) occurrence of pregnancy (Mott and Shaw 1978; Sharp and Richardson 1977); (6) physical limitations (Troutman and Breshears 1969); and (7) race (Bachman, Green, and Wirtanen 1971; Howell and Frese 1982; Rumberger 1981). In the present context, those variables that have been of special significance in the prediction of dropout behavior are considered.

Evidence pointing to a relationship between race and dropping out abounds. The report Dropout Prevention (National Advisory Council 1975, p.2) presented a profile of the average dropout as a black male who leaves school in the eleventh grade at age seventeen. He is one or more years retarded in grade placement, and is likely to be failing at the time he leaves.

Novak and Dougherty (1979) reported that the distribution of dropouts by race was: 88 percent white, 8 percent black, 2 percent Native American, and 1 percent Hispanic. The incidences of dropping out among blacks and Native Americans occurred in disproportionate numbers. Of the total population in the area studied, blacks accounted for 4.3 percent, and Native Americans for 0.3 percent. The disproportionality in numbers was confirmed by the Minnnesota State Department of Education (1981). Rumberger (1981) also found that minority men and women are more likely to drop out of high school than whites. He noted, however, that for individuals with similar background characteristics, the predicted probabilities of dropping out are much more similar between whites and minorities. He reported predicted probabilities that ranged from 10 to 16 percent for individuals from advantaged backgrounds and from 23 to 44 percent for individuals from disadvantaged backgrounds. Contrary to other researchers' findings, Howell and Frese (1982) reported that being white is positively

related to dropping out. They concluded that when gross socio-economic differences between races are reduced by the research sampling design, race differentials in leaving school prematurely reverse.

The literature also shows a relationship between sex of a student and dropping out. Grasso and Shea (1979) reported that over a one-year period, males were more likely than females to be early school leavers. Novak and Dougherty (1979), in their study of early school leavers over a nine-year period from 1967 to 1976, found a 42 percent dropout rate among the 410 females studied. Of the 546 males studied, a dropout rate of 57 percent was found.

The aforementioned relationship between sex and dropout behavior is generally reported, but when specific program areas are considered, deviations from the general pattern may be observed. Resta and Temple (1978) noted that in cases where students were in vocational education programs that were traditionally dominated by one sex, a much higher dropout rate occurred among members of the nontraditional sex.

The profile of the female dropout frequently includes pregnancy. The National Advisory Council on Supplementary Centers and Services (1975) found that pregnancy and the birth of a baby were among the most common reasons that female students gave for dropping out of school. Grasso and Shea (1979) confirmed that pregnancy and marriage-related reasons significantly influence female dropout behavior, and suggested that this could account for one-third of all cases. Rumberger (1981) also found that women who had a child within nine months of leaving school or later were much more likely to be high school dropouts than women who had never had a child.

A study of 40 percent of the school systems in Ontario, Canada revealed a total annual dropout rate of 12.4 percent (Watson 1976). Sixteen years was the age at which most dropping out occurred. The Oklahoma State Department of Vocational and Technical Education (1981) reported seventeen as the age at which most dropping out occurred in that state. Whatever the age, the eleventh grade has been found to be the peak year for the occurrence of dropping out (Minnesota State Department of Education 1981; Oklahoma State Department 1981).

According to Lloyd (1978), future dropouts differed from future graduates by the time students attain the third grade. Novak and Dougherty (1979) conceded that it was easy to identify potential dropouts by the time they attained the age at which they could legally drop out, but contended it was much more difficult to identify students who were in trouble at a sufficiently early age to give them the help that they needed.

Affective characteristics. Literature that discusses the phenomenon of dropping out among high school youth has identified many affective characteristics of dropouts that are school related. Dropouts have frequently cited conflicts with teachers and other school personnel as primary reasons for leaving school early (Dye, Ruling, and Tanaka 1968; National Advisory Council 1975; Nogales Public Schools 1975; Novak and Dougherty 1979; Watson 1976).

Novak and Dougherty (1979) reported that early (elementary level) indicators of potential dropouts included low self-esteem. Low self-esteem on the part of students could lead to fear of academic failure. With progression from one grade level to the next, students realized that teachers with higher standards were found at higher grade levels. Such a realization contributed to students' fears. According to Bachman, Green and Wirtanen (1971), students' concept of their school ability was one of six variables that accounted for 30 percent of the variance in educational attainment. An important issue is to what extent poor academic performance is a result of low self-esteem and to what extent it is a cause of low self-esteem.

Related to low self-concepts are feelings of alienation, isolation, and insecurity on the part of youth. Novak and Dougherty (1979) indicated that dropouts tended to be immature, suggestible, easily distractible, and to have had difficulty identifying with other people. Bachman, Green and Wirtanen (1971) found that among persons who felt some control over their destinies, the dropout rate was lower than among those who expressed feelings of alienation and inadequacy.

The factors by which dropouts may be characterized, as outlined in the preceding paragraphs, interact to produce the disruptive behavior for which many dropouts are known. The National Advisory Council on Supplementary Centers and Services (1975) presented a picture of a dropout as one who was often disruptive and who showed hostility towards adults and authority figures. Bachman, Green and Wirtanen (1971) reported that the likelihood of dropping out was greater among those individuals who had a high need for independence and those who were aggressive.

The problems that dropouts report they had in school were varied. Sharp and Richardson (1977) concluded that dropouts left school because they had problems with school itself. This conclusion, though less true for white women than for the remainder of the dropout population, is indicative of the dropouts' perceptions of their school experiences. Often student withdrawal was due to lack of interest in a particular curriculum (National Advisory Council 1975). Students also reported failure to see the relevance of education to life experiences (Novak and Dougherty 1979). According to a study conducted by the Australian Government (1977), students left school because they found it dull and boring, among other reasons.

Grasso and Shea (1979) reported that young men who changed their curricula to move into the vocational category in 1967 had been among the least satisfied with school during the previous year. This movement often prompted favorable changes in attitudes of the young men toward school.

As Berryman (1980) noted, unless it is possible to adjust statistically for student characteristics prior to track placement, it is impossible to conclude that the vocational track reduces dropping out. If the general track enrolls disproportionate numbers of students who are disposed to drop out, any observed difference between curricula may only reflect this predisposition. Analyses in which some preplacement controls were introduced yielded contradictory results relative to the effects of vocational education programs on school completion (Grasso and Shea 1979). Furthermore, information is not available for many important, pre-enrollment characteristics of students for which controls should be imposed.

Novak and Dougherty (1979) suggested that dropouts had a tendency to lack future goal orientation. Sharp and Richardson (1977) found that many dropouts (41 percent) conferred with no one about their future. It was noted previously that potential dropouts have had difficulty relating their education to life experiences. In the absence of life goals, such difficulty would seem quite likely.

Cognitive characteristics. Differences in the academic performance of future dropouts and graduates are observable in the elementary grades. Lloyd (1978) documented differences in cognitive abilities such as reading, arithmetic, and language-skill achievement. The Minnesota State Department of Education (1981), Novak and Dougherty (1979), the New York City Public Schools (1979), the National Advisory Council on Supplementary Centers and Services (1975), and Weber et al. (1981) all reported a relationship between low reading ability and dropping out.

Given this well-documented relationship, it is surprising that in the Youth in Transition study (Bachman, Green, and Wirtanen 1971), measures of academic ability explained only 4.5 percent of the variance in educational attainment. When combined with the students' family characteristics, 17.8 percent of the variance was explained. According to the National Advisory Council for Supplementary Centers and Services (1975), on a four-point grading scale, the median grade for students who dropped out was 1.14 (letter grade "D") during their last complete year in school. Slightly over twelve percent (12.2) had obtained no grade above "F" and 13 percent had mostly "Fs." Most of the dropouts had been "C" students while in the seventh grade. Of the two variables that Branter and Enderlein (1972) presented as the best predictors of dropping out, one was the student's grade point average.

The typical dropout is also likely to score low on standardized tests of intelligence. In a study of dropouts in the Los Angeles school district, the National Advisory Council on Supplementary Centers and Services (1975) reported a median IQ for dropouts of 89. This was below the district's mean of 96. Weber et al.'s (1981) review of several studies yielded a mean IQ of 90 for dropouts. Furthermore, they indicated that the dropout-prone student seldom questioned or reasoned critically. Watson (1976) found that early school leavers who were persuaded to return to school full-time were those who had been the academically better students prior to dropping out, and not those who were low in IQ and failing.

Summary of individual characteristics. Literature pertaining to the individual characteristics of dropouts was reviewed under three headings--demographic, affective, and cognitive. Based upon the demographic literature, the typical dropout is sixteen or seventeen years old and is retarded in his or her grade level by one or two years. If the dropout is female, she is likely to have left school for reasons related to pregnancy.

Literature on the affective characteristics of dropouts suggests that the dropout is likely to have experienced conflicts in relating to teachers. Beyond the boundary of the school, the dropouts' relationships with adults and authority figures are characterized by hostility and aggression. Dropouts have a high need for independence, but show signs of low self-esteem and concerns about their ability to perform academically. Dropouts feel alienated, isolated, and insecure, and tend to be immature, suggestible, and easily distracted. These characteristics lead to difficulties in identifying with others.

By the time the third grade is attained, dropouts are likely to exhibit below-average performance in such areas as reading, arithmetic, and language. IQ and reading ability are low, and dropouts are deficient in verbal skills. By the seventh grade, dropouts' grade point averages are likely to be equivalent to letter grade "C." Grade point average at this level is a good predictor of dropping out.

Family Characteristics

In this section, literature examining the family characteristics of dropouts is discussed. The discussion addresses (1) family size and nature, (2) family SES, (3) English as a second language, and (4) family religious orientation.

Family size and nature. Several studies reported that young people who had many siblings were more likely to drop out (Bachman, Green, and Wirtanen 1971; Rumberger 1981; Shaw 1979; Watson 1976; Weber et al. 1981). Lloyd (1978) found that a

difference was noticeable in the size of families of future dropouts and graduates even by the time the students attained the third grade. The National Advisory Council on Supplementary Centers and Services (1975) reported that the profile of a dropout usually included having more younger siblings at home. Novak and Dougherty (1979) reported that on the elementary level, the existence of siblings who had dropped out was another indicator of potential for dropping out among youth.

Students who dropped out reported living in a family situation that was quite stressful (New York City Public Schools 1979; National Advisory Council 1975). The findings of Howell and Frese (1982), which showed that dropping out was related to the quality of the relationship between students and their parents, suggested one area of the students' home life in which stress could be experienced.

Living in a "broken home" could also contribute to family stress felt by early school leavers. Novak and Dougherty (1979) reported that the absence of a father from the home constituted a potential influence on dropping out that may have been manifest at the elementary school level. Bachman, Green, and Wirtanen (1971) reported that the absence of a mother from the household when the child was age fourteen increased the probability of dropping out.

Family SES. The occupational and educational status of parents was related to dropping out among students (Howell and Frese 1982). A Los Angeles study (National Advisory Council 1975) presented statistics on the occupations of the heads of households that indicated that fathers of dropouts were more apt to be unemployed. Branter and Enderlein (1972) noted that a larger percentage of dropouts came from the highly disadvantaged rather than moderately disadvantaged households.

Dropouts often mentioned the need to work as a reason for leaving school early (Oklahoma State Department 1981; National Advisory Council 1975; Troutman and Breshears 1969; Weber et al. 1981). Coombs and Cooley (1968) observed, however, that economic conditions did not appear to be a factor that forced students out of school, but were important predictors of college attendance. Based on a sophisticated multiple regression analysis, Bachman, Green and Wirtanen (1971) concluded that the effect of SES on high school completion was indirect rather than direct. The impact of family background was important, but it occurred largely through academic skills as intervening variables.

Grasso and Shea (1979) analyzed NLS data covering the period from 1966 to 1973, and used a summary measure called socioeconomic origins (SEO) in controlling for differences in the effect of family background on educational attainment. The components of SEO were (1) level of education of father, mother, and

oldest sibling (where applicable); (2) father's occupation when respondent was age fourteen; and (3) an index of the availability of reading material in the home at the time. Grasso and Shea reported a stronger relationship between SEO and college attendance than between SEO and high school completion.

Another early indicator of potential for dropping out mentioned by Novak and Dougherty (1979) was parents' educational level. Masters (1969), Rumberger (1981), and Watson (1976) reported that the probability of dropping out was increased among students from households in which the father had not completed at least the twelfth grade.

Howell and Frese (1982) reported that the mother's educational status was also associated with dropping out among students. When both parents showed signs of verbal deficiencies, their attitudes toward education were usually such that minimal encouragement, if any, was given to children to persist in school. McNally (1977) and Rumberger (1981) found that the amount of reading material in the home that was available to children related to whether or not they would drop out. Of the dropouts studied by Watson (1976), approximately 66 percent of the parents were reported to have acquiesced to the students' decisions to drop out.

English as a second language. Dropping out was found to occur disproportionately among students who enrolled in courses that focused on English as a second language (National Advisory Council 1975). The difficulties that students encountered in learning the language were cited as the major reason for dropping out.

Family religious orientation. Nam et al. (1968) reported that being non-Catholic was related to a higher probability of dropping out. However, from the analysis of Youth in Transition data, Bachman (1970) concluded that parental socioeconomic level exercised more impact on dropping out than did family religious performance or practice. This generalization did not apply in the case of Jewish respondents. Members of the sample who were Jewish were found to be above average in intelligence and socioeconomic level. Even when these factors were controlled, the Jewish respondents were higher than any other religious subgroup in self-esteem, political knowledge, occupational aspirations, and college plans, and were therefore less likely to drop out.

Bachman, Green, and Wirtanen (1971) found that rates of dropping out among Catholics were identical to those for the rest of the sample. Episcopalians were below average in dropout rate, while for Baptists, the reverse was true. However, these relationships virtually disappeared when statistical controls for socioeconomic level and other background dimensions were introduced.

Summary of Literature on Family Characteristics. Dropouts are likely to come from homes with large numbers of siblings, some of whom are younger. An early indicator of students' potentials for dropping out of school is the presence in the home (or away from home) of older siblings who themselves are dropouts.

Home conditions that are stress-producing can lead to dropping out among youth. Stress was defined in these studies by the quality of parent-child relationships, and the absence of a parent from the home ("broken home"). Dropping out is related to patterns of chronic unemployment among fathers, and dropout rates increase when the economic level of the family drops below moderately disadvantaged. Indicators of the direct effect of socioeconomic status on high school completion are not clear. A more direct relationship can be traced between socioeconomic status and college attendance.

Dropout rates are disproportionately high among students who enroll in courses for English as a second language. Dropouts often cited the difficulties they faced in learning a new language as the source of their discouragement and decision to quit school.

Dropping out is almost nonexistent among Jewish youngsters, who are significantly higher than the average on intelligence and socioeconomic level. Episcopalians are below average in dropout rate; the reverse has been observed among Baptists. Being non-Catholic is related to an increase in the probability of dropping out.

Contextual Variables

In addition to those already discussed, there are many other variables that have been identified as having some influence on the school attendance patterns of youth. The variables discussed in this section are classified as contextual (e.g., place of residence and local unemployment rates).

Conlisk (1969), Nam, Rhodes, and Harriott (1968), and Rumberger (1981) found that geographic location related to dropping out. Rumberger reported that except in the case of blacks, location of residence at fourteen years of age affected the likelihood of dropping out. The likelihood of dropping out was increased in the case of white females who resided in the South, but was decreased for those who resided on a farm. In the case of Hispanic males, residence in the South increased the probability of dropping out.

According to Rumberger (1981), current residence also affected school attendance patterns of youth significantly, but this was true for males more than it was for females. Residence

in the South lowered the probability of dropping out for black males and females and for Hispanic males, after controlling for differences in family background. For black males residing in the central city, the tendency to drop out was increased when compared to individuals residing in rural or suburban areas. Branter and Enderlein (1972) and the Minnesota State Department of Education (1981) reported higher dropout rates among students from the inner city and large suburban areas than among rural, small city students.

Local unemployment rates were related to the likelihood of dropping out. When unemployment rates were low, the likelihood of dropping out of school was increased among minority males from disadvantaged backgrounds over minority males from advantaged backgrounds. This tendency was the opposite for white females. Increased local unemployment was associated with increased likelihood of dropping out among white females (Rumberger 1981).

Summary of literature on contextual variables. Area of residence of youth both at age fourteen and at present have been shown to be related to the likelihood of dropping out. The pattern is complex and varies by sex, race, and geographical area. The influence of current residence has been more marked for males than it has been for females. An inverse relationship exists between local unemployment rate and the likelihood of dropping out among minority males. Among white females, there is a direct positive relationship between local unemployment and dropping out.

School Characteristics

Given that dropouts withdraw from a specific environment, it is surprising that this environment, the school, has not received more attention. Novak and Dougherty (1979) found that one reason students dropped out was that the school system did not make enough effort to respond to potential dropouts. This finding was more correctly applied to males than to females, however, since--as Resta and Temple (1978) reported--males dropped out for school-related reasons while females dropped out for more personal reasons. The Wisconsin Vocational Studies Center (1980) reported no significant relationship between student-teacher ratio and dropout rates. However, the Wisconsin study did report higher dropout rates in larger schools.

The National Advisory Council on Supplementary Centers and Services (1975) reported that inappropriate instructional strategies or curricula were school-related reasons for dropping out among youth. Curriculum weaknesses were manifest in some schools that failed to make provisions for those youth who were not college-bound. In such cases students who saw no relevance between the curricula offerings and their future plans lost the interest

and motivation that were necessary for persisting academically. Often, failing to understand the plight of such students, school officials decided that school was not the place for them (New York City Public Schools 1979).

The absence of structures for providing individualized attention to students who need such services was another manifestation of curriculum weakness. According to Novak and Dougherty (1979), dropout-prone students tended to be unable to tolerate structured activities, and thus may have needed special attention to prevent early school leaving. The National Advisory Council on Supplementary Centers and Services (1975) included, in the profile of a dropout, the inability to function properly within traditional classroom settings.

The absence of certain supportive services that schools usually provide was related to dropping out. The National Advisory Council on Supplementary Centers and Services (1975) found that dropout rates increased in schools where counseling services were not provided, or where those provided were inadequate. The absence of work-study programs and remedial attention for students who needed it were also related to higher rates of dropping out.

In Klausmeier's (1982) view, the importance of school variables in understanding or explaining educational achievement has heretofore been taken for granted by most educational researchers. It has not been until lately that investigators (Brookover et al. 1979; Madaus, Airasian, and Kellaghan 1980; Rutter et al. 1979) indicated that school variables, as well as student and home variables, influenced student outcomes. In his review of literature related to the influence of school variables on educational attainment, Rumberger (1981) observed that even though the importance of school variables has been recognized, previous research focused on students who finished high school, and not on those who dropped out. Rumberger concluded that the influence of school factors on dropout behavior remains an important area for further research.

Summary of literature on school characteristics. School environment, and the absence of appropriate curriculum and supportive services when needed by students, relate to dropping out. Dropping out is encouraged through weaknesses in the schools' curricula where appropriate attention is not given by teachers and administrators to the placement of non-college-bound students, such that they see some relevance between curriculum offerings and future plans.

Dropout-prone students often resist structured learning activities and need the individualized attention of teachers if they are to be encouraged to persist academically. Other services that provide a measure of support to students include counseling services and opportunities to acquire work experiences and

share in the resultant benefits. Due to the sparsity of research on the effects of school variables on dropping out, additional research on school effects is needed.

High School Experience

There is some evidence that points to a relationship between high school experiences of youth and their probability of dropping out. Duration of attendance at individual schools, attendance records, grade repetitions, and levels of participation in school activities have been associated with the decision to withdraw.

According to the National Advisory Council on Supplementary Centers and Services (1975), over 30 percent of dropouts spent one semester or less in the school they attended last. The tendency on the part of youth to switch schools produced a lack of rootedness and hence led to dropping out.

Students with high absentee rates were more likely to drop out. The National Advisory Council on Supplementary Centers and Services (1975) identified the eighth grade as the time when patterns of absenteeism first became noticeable. Howell and Frese (1982), the Minnesota State Department of Education (1981), the Oklahoma State Department of Vocational Education (1981), and Branter and Enderlein (1972) reported that dropouts showed high levels of school absenteeism. The Oklahoma State Department of Vocational Education (1981) identified patterns of nonattendance among youth as a primary reason for dropping out. Branter and Enderlein (1979) found number of days absent was one of the two best predictors of dropping out.

Robins and Ratcliff (1978) reported that truancy in the elementary grades provided a forecast of truancy at the secondary level. Future truancy appeared to be especially strengthened in those youth who demonstrated other forms of deviant behavior. Truancy both in the elementary and high schools was a predictor of dropping out. According to the Minnesota State Department of Education (1981), students with high participation in extracurricular activities were less likely to drop out.

A positive relationship was found to exist between grade failure of one or more years and dropping out. This relationship was also reported in a previous section of this chapter. Sharp and Richardson (1977) found that over 30 percent of black dropouts had been suspended or expelled. Like grade detention, the experience of being suspended or expelled was another of several school-related reasons given for dropping out (National Advisory Council 1975).

Novak and Dougherty (1979) indicated that in Minnesota, 35 percent of males and 24 percent of females dropped out because they did not like school. Fifty-one percent of the dropouts studied reported academic difficulties and deficiencies. Watson (1976) found that youth who said that they dropped out because they were failing were disproportionately younger than other youth. Early school leavers who had been out of school for less than one year were more likely to return to school, than those who had been out of school for a longer period of time (Larter and Cheng 1979).

Summary of literature on high school experience. The following school experience variables are among those that are positively related to dropping out: (1) inappropriate curriculum, (2) frequent relocation from school to school, (3) absenteeism, (4) truancy, (5) low participation in extracurricular activities, (6) grade failure, (7) suspension, and (8) expulsion from school. Patterns of attendance and nonattendance have been noted as being one of the two best predictors of dropping out or completing school among youth.

Reporting on their reasons for leaving, dropouts claimed to dislike school. They also cited academic difficulties and deficiencies. Academic failures were found to be disproportionately younger than other dropouts. Dropouts who returned to school were more likely to be among those who were out of school for less than a year.

Labor Market Effects Associated with Vocational Education and Dropping Out of High School

Numerous studies have examined the labor market effects of vocational education (Campbell et al. 1981; Grass and Shea 1979; Gustman and Steinmeier 1981; Mertens et al. 1980; Mertens and Gardner 1981; Meyer 1981a, 1981b; National Institute of Education 1981). The results of the studies varied by such factors as the definition of vocational education that was used (i.e., self-report or transcript-based), the specification of the sample (e.g., respondents with exactly twelve years of education or those with some postsecondary education), and identification of vocational program areas. Generally, the studies reported either positive or no significant difference for the effects of vocational education on labor market experiences. This generalization obviously ignores the many qualifications that should have been included. The results in the present study of an analysis of the labor market effects of vocational education are presented in chapter 4. The results of previous research are also reviewed in greater detail in that chapter.

The labor market effects of dropping out of school have also been examined in numerous studies (Bachman, Green, and Wirtenan

1971; Grasso and Shea 1979; King 1978; O'Malley et al. 1977; Redfering and Cook 1980; U.S. Department of Labor 1981). The general picture of the labor market experiences of high school dropouts is negative, especially in terms of high unemployment rates. As with the labor market effects of vocational education, the results of previous research on the effects of dropping out of school will be presented in greater detail in chapter 4.

CHAPTER II

METHODOLOGY AND CHARACTERISTICS OF THE SAMPLE

This study was designed to investigate two main issues: (1) the effects of vocational education on high school completion and (2) the labor market effects of different curricular experiences for high school dropouts and graduates. Data to address these issues were obtained from the National Longitudinal Surveys of Labor Market Experience, New Youth Cohort (NLS Youth).

The NLS Youth survey was developed by the Center for Human Resource Research (CHRR) with support from the U.S. Departments of Labor and Defense. In an effort to supplement the interview data, the National Center for Research in Vocational Education sought to collect the high school transcripts of the NLS Youth respondents. In 1980, with funding from the U.S. Department of Education, Office of Vocational and Adult Education, and under a collaborative agreement with CHRR, the National Center contracted with the National Opinion Research Center to collect the transcripts of persons who were seventeen or older at the time of the first interview. Transcripts were again collected in 1981 for respondents who were aged fifteen or sixteen at the first interview, and these transcripts were also included in the analyses.

The NLS Youth is a national probability sample of 12,686 persons who were between the ages of fourteen and twenty-one when originally selected in the fall of 1978. Interviews were conducted with the same individuals in 1979, 1980, 1981, and 1982; additional interviews are planned for 1983 and 1984. The data used in the current study come from the 1979 and 1980 surveys. The sample was drawn from the youth population in three stages: (1) a cross-sectional sample; (2) a supplemental sample of blacks, Hispanics, and economically disadvantaged whites; and (3) a sample of youth serving in the military. The cross-sectional and supplemental samples were stratified by sex, and relatively equal proportions of men and women were included. The military sample was composed of approximately one-third women and two-thirds men. Weighting procedures were developed to adjust for the oversampling of certain groups. Individuals residing in institutions on a permanent basis were excluded from the sample. For further information on this data base, the reader is referred to the National Longitudinal Survey Handbook (Center for Human Resource Research 1981).

Analysis Procedures

The analysis plan for this study evolved from the model presented in chapter 1 and the research questions of interest (i.e., What is the effect of vocational education on the retention of

young people in high school who might otherwise drop out? What are the labor market effects of dropping out of high school for persons with different curricular experiences?). A list of independent and dependent variables was generated based on the results of previous research on dropouts and labor market effects of vocational education.* This list was then compared with variables that are available in the NLS Youth data base. Data were available for the majority of the items on the original list. Notable exceptions include information concerning the availability of individualized instruction, expenditures per pupil, whether the school was comprehensive or vocational, percent of students in each school who went to college, and parent's ability level. These were not felt to be serious omissions, considering the number and type of variables that were available. Nearly 150 variables were obtained from the NLS Youth data base.

Reducing the Number of Variables

In order to reduce the number of variables to a more manageable size, thirteen Varimax rotated factor analyses were conducted for subsets of variables included in each major component of the model (see Appendix A). The subsample included in the analyses NLS Youth respondents who were sixteen years of age or older in 1980 and had either courses or credits on their high school transcripts for grades nine or ten (n = 7,416) (see table 1).**

The thirteen categories of variables, organized by the model components, consisted of the following:

- Contextual

    1. labor market (e.g., percent employed in manufacturing; unemployment rate)

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*Appendix A displays the independent variables that were used in the initial analyses.

**The age of sixteen in 1980 represents the youngest group for which transcripts were available. The actual number of NLS Youth aged sixteen or older with courses or credits on their high school transcript in grades nine or ten is 7,416. Fifty-five of the respondents were inadvertently left out of the factor analyses due to a coding error. It is not anticipated that inclusion of these individuals would substantially change the results of the factor analyses, and they were included in subsequent analyses.

TABLE 1

TRANSCRIPT AVAILABILITY BY HIGHEST GRADE COMPLETED

(IN PERCENTAGES)

Information Available on Transcript	Highest Grade Completed						
	9		10		11		
	Complete	Dropout	Complete	Dropout	Complete	Dropout	Total
No Credits: Courses Only	6.6	25.9	6.5	16.3	6.5	9.8	7.7
	(458)	(60)	(365)	(56)	(272)	(32)	(572)
Credits: Grade 9	2.7	54.7	1.7	23.3	1.5	8.3	5.4
	(189)	(127)	(97)	(80)	(62)	(27)	(402)
Credits: Grade 9, 10	5.4	14.7	2.9	41.4	2.3	14.8	6.2
	(375)	(34)	(159)	(142)	(98)	(48)	(461)
Credits: Grade 9, 10, 11	8.5	1.7	8.2	10.5	4.8	45.5	8.3
	(589)	(4)	(457)	(36)	(200)	(148)	(618)
Credits: Grade 9, 10, 11, 12	69.0	1.3	72.4	2.3	75.8	13.5	64.8
	(4786)	(3)	(4036)	(8)	(3170)	(44)	(4804)
Credits: Grade 10, 11, 12	4.6	0.0	5.0	0.3	5.8	1.2	4.3
	(317)	(0)	(279)	(1)	(241)	(4)	(318)
Credits: Other Combinations	3.2	1.7	3.3	5.8	3.3	6.8	3.2
	(224)	(4)	(185)	(20)	(137)	(22)	(241)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	(6938)	(232)	(5578)	(343)	(4180)	(325)	(7416)

NOTE: The numbers in parentheses represent the unweighted sample size.

- School Characteristics

    2. school characteristics (e.g., availability of vocational education; number of students)

    3. peers (e.g., percent disadvantaged, black, or Hispanic in the school)

    4. teachers (e.g., percent minority teachers; percent who left at the end of the school year)

- High School Experiences

    5. high school experiences (e.g., days absent; enrollment in remedial education)

- Family

    6. family (e.g., highest grade completed by mother and father; whether or not mother worked for pay)

- Individual

    7. individual (e.g., highest grade aspired to; age expect to marry)

    8. demographic (e.g., percent of urban population where resides; resides in northwest, north central, or western U.S.).

    9. current school attitudes (e.g., school is unsafe)

    10. self-esteem (e.g., feels like a failure; person of worth)

    11. locus of control (i.e., Rotter scale)

    12. illegal activities (e.g., damaged property; smoked marijuana)

    13. cognitive (e.g., grade point average; Knowledge of the World of Work test score)

The general strategy for variable selection was to select one of the heavily weighted items for each factor. This procedure is analogous to item selection for an attitude or achievement measure. The items that correlate best with the total score are selected for the final instrument. This procedure was followed rather than correlating all the items with whether or not the respondent dropped out for two reasons. The first was to avoid capitalizing on chance relationships which were sure to occur with some one hundred and fifty independent variables. The

second was to provide more clarity in the interpretation of the regressions. The coefficients associated with the selected variables could be interpreted in terms of the specific concepts the selected items addressed. The intent of this strategy was to select variables that were representative of each category of variables, and that would then provide a means of controlling for that category in subsequent analyses. This strategy was followed for the analyses of the demographic, labor market, school characteristics, peer, teacher characteristics, high school experience, and current school attitude subsets.

Because the family subset resulted in six factors, a slightly different strategy was used. The first three factors accounted for 80 percent of the common variance; therefore, the last three factors were dropped. The heavily weighted family variables on factors one and three were included in a composite SES variable that was used in subsequent analyses; therefore, these variables were dropped. Consequently, only one variable (other than the composite SES) was chosen from the family subset for inclusion in subsequent analyses (i.e., mother worked for pay). For the individual subset, the first two factors accounted for 93 percent of the common variance; therefore, the third factor was dropped.

The factors for the self-esteem, illegal activities, and cognitive subsets represented more tightly conceptualized units than the other subsets (e.g., demographic variables). Therefore, rather than selecting individual heavily weighted variables, factor scores were constructed for these subsets. The self-esteem scale was scored in such a manner that a low score was associated with high self-esteem. The factor scores for the illegal activities subset represented property damage or theft, involvement with the formal legal system, and drug usage or selling. The two factor scores for the cognitive subset represented high school English and math grade point average (GPA), and scores on the Knowledge of the World of Work test (WOW).

The Rotter scale factor was dropped from subsequent analyses because of its low reliability (.36) (Wimmerus and Crowley 1981). The scale's lack of internal consistency was manifested in the factor analysis results, as well. Four factors resulted, the variance was not concentrated on any one factor, and the weights were not systematically distributed in any interpretable pattern.

The end result of these analyses was a list of twenty-nine variables to be used in subsequent analyses (see table 2; also, see table 3) for an explanation of the independent and dependent variables). These twenty-nine variables were supplemented by eight demographic variables judged to be important enough to be included a priori in the analyses (e.g., sex, race, SES, time of marriage, and time of childbearing or fathering).

TABLE 2

REGRESSION RESULTS FOR THE PREDICTION OF DROPPING OUT OF HIGH SCHOOL: ORIGINAL AND REDUCED REGRESSION EQUATIONS

	Original Equation		Reduced Equation+	
	B	t	B	t
WOW	-.98	-17.09**	-.97	-17.11**
SES	-.08	-1.43	-.07	-1.19
FEMALE	-1.35	-1.42	-1.45	-1.55
BLACK	-4.47	-3.19*	-3.69	-3.10*
HISPANIC	-1.77	-1.09	3.03	2.13
NEAST	-2.15	-1.62		
NCENTRAL	-.93	-.77		
URBAN	.00	.52		
% MFG	-.01	-1.52		
%GOVT	.02	1.23		
#STUDENTS	.00	1.17		
OFFAVAIL	-1.57	-.89		
TIAVAIL	-.48	-.33		
% BLACK	.01	.28		
% DISADVANTAGED	.01	.57	.01	.61
% HISP FAC	-.04	-.50		
% BLACK FAC	-.01	-.23		
% TEACH TURN	-.04	-.68		
DAYSAB 10	.38	7.83**	.38	7.83**
DAYSAB 11	-.16	-3.08*	-.15	-2.94*
REMED 1	7.16	4.79**	7.29	4.94**
REMED 3	.66	.12		
MOTH WORK 14	.28	.32		
HGASPIR2	-3.44	-14.57**	-3.31	-14.22**
AGE MARR	.44	.74		
NOTSAFE	-.12	-.09		
GETAWAY	-1.31	-1.24		
JOBCOUNSEL	-1.56	-1.51		
KIDEARLY	9.32	5.72**	9.20	5.66**
KIDLATE	11.15	7.98**	11.32	8.13**
MEARLY	4.64	1.00	4.27	.92
MLATE	-3.64	-2.10	-3.50	-2.05
SELF	.25	4.56**	.24	4.45**
THEFT	.18	3.40*	.18	3.38**

TABLE 2
(Continued)

	Original Equation		Reduced Equation+	
	B	t	B	t
LAW	.37	8.84**	.38	8.99**
DRUGS	.15	2.89*	.15	3.01*
GPA	-.59	-8.97**	-.61	-9.22*
Constant	71.04		60.68	
R^2	.33		.33	
$\bar{R}^2$	.32		.32	
n	4901		4901	

NOTE: Coefficients have been multiplied by 100. See table 3 for an explanation of the independent and dependent variables.

*p<.10
**p<.05

+The coefficients obtained from the reduced equation were subsequently used to construct a variable indicating the probability of dropping out of high school.

TABLE 3

INDEPENDENT AND DEPENDENT VARIABLES
USED IN THE REGRESSION ANALYSES

Individual

AGE	=	Respondent's age at the time of the 1980 interview
AGEMARR	=	Age at which respondent expects to marry
AGESQ	=	AGE^2
BLACK	=	1 if the respondent is black, 0 otherwise
DRUGS	=	A factor score where a high value is associated with drug usage
GPA	=	A factor score for high school GPA in English and math
HISPANIC	=	1 if the respondent is Hispanic, 0 otherwise
KIDEARLY	=	1 if had a child during high school or within nine months of leaving school, 0 otherwise
KIDLATE	=	1 if had a child over nine months after leaving high school, 0 if never had a child
LAW	=	A factor score indicating involvement with the formal legal system
MEARLY	=	1 if married during high school or within two months after leaving high school, 0 otherwise
MLATE	=	1 if married over two months after leaving high school, 0 if never married
NOYRSSCHL	=	Number of years of school completed by the respondent
SELF	=	A factor score of self-esteem where a high score is associated with low self-esteem
THEFT	=	A factor score indicating involvement in theft
WOW	=	A factor score for the Knowledge of the World of Work test

TABLE 3
(Continued)

Family

MOTHWORK = 1 if mother worked when the respondent was age 14, 0 otherwise

SES = Composite variable with mother's and father's education; father's (or mother's if father absent) occupational prestige; reading materials available in the home at age 14

Contextual

NCENTRAL = 1 if respondent resided in the north central region at the time of the 1980 interview, 0 otherwise

NEAST = 1 if respondent resided in the north east at the time of the 1980 interview, 0 otherwise

%GOVT = Percent of individuals in the respondent's county employed by the government

%MFG = Percent of individuals in the respondent's county employed in manufacturing

RURAL = 1 if resident resided in a rural area at the time of the 1980 interview, 0 otherwise

SOUTH = 1 if respondent resided in the south at the time of the 1980 interview, 0 otherwise

URBAN = 1 if the respondent resided in an urban area at the time of the 1980 interview, 0 otherwise

UNEMPR = Unemployment rate in the respondent's county of residence

WEST = 1 if respondent resided in the west at the time of the 1980 interview, 0 otherwise

High School Experience

DAYABS10 = Number of days respondent missed school in tenth grade

DAYABS11 = Number of days respondent missed school in the eleventh grade

DROP80 = 1 if reported leaving high school without completion in the 1980 interview, 0 otherwise

TABLE 3
(Continued)

REMED1 = 1 if respondent took remedial English, 0 otherwise

REMED2 = 1 if respondent took courses in English as a second language, 0 otherwise

VOCCRED = Number of high school vocational credits

VOCDROP = Interaction of VOCCRED and DROP80

School Characteristics

%BLACK = Percent black students in the school

%BLACKFAC= Percent black faculty in the school

%DISADV = Percent disadvantaged students in the school

GETAWAY = 1 if respondent said you could get away with anything at the school, 0 otherwise

%HISPFAC = Percent Hispanic faculty in the school

JOBCOUNS = 1 if respondent said the school offered job counseling, 0 otherwise

#STUDENTS= Number of students in the school

NOTSAFE = 1 if respondent said the school was not safe, 0 otherwise

OFFAVAIL = 1 if business and office courses available in the school, 0 otherwise

%TEACHTURN= Percent of teachers who leave at the end of the school year

TIAVAIL = 1 if trade and industry courses available in the school, 0 otherwise

Dependent Variables

DROPOUT = 1 if respondent reported leaving high school without completion at the time of the 1980 interview, 0 otherwise

TABLE 3
(Continued)

LABORFORCE	=	1 if respondent was a member of the labor force at the time of the 1980 interview (i.e., with a job, or looking for work), 0 otherwise
UNEMPLOY	=	1 if respondent was unemployed and looking for work, 0 otherwise

Determining Predictors of Dropout

The next step in the analysis plan was to determine the variables that were significantly related to dropping out of high school. The sample was limited to individuals who were eighteen or older in 1980, who had information on the highest grade completed and enrollment status, and who had transcript data for grades nine or ten. These limitations were necessary in order to insure that the subsample had had an opportunity to graduate from high school, and their status as completor or dropout was known. This resulted in a sample size of 4,901.

Ordinary least squares (OLS) regression analysis was chosen as the statistical method to select those variables that were associated with dropping out of high school and to divide the sample into two groups--those with a high probability of dropping out and those with a low probability. OLS is not the most efficient method of estimation with dichotomous dependent variables, and standard tests of significance are not strictly appropriate because the error term has a heteroskedastic and nonnormal distribution. However, the linear probability model has advantages that argue strongly for its use in cases (like the present one) in which the mean values of the dependent variable over the sample are not too close to their limits, 0 or 1. The advantages include lower cost of estimation, simplicity of data preparation, ease of interpretation of estimated coefficients, and the facility with which more complex conditional probabilities can be derived by simple addition from the estimated equations.* In view of these advantages and the controversy surrounding the theoretical model that underlies more sophisticated techniques such as probit analysis (see Judge et al. 1981), OLS was the analytic technique of choice in this instance. In subsequent analysis of the effects of vocational experiences, both OLS and probit analyses were used.

An ordinary least squares regression analysis was conducted that took the following form:

$$Y = a + b_1X_C + b_2X_S + b_3X_H + b_4X_F + b_5X_I + e \qquad (1)$$

where

Y = 0 if graduated, and 1 if dropped out
C = Contextual variables
S = School characteristics (except availability of vocational education in the high school)
H = High school experience variables (except extent of vocational education participation)
F = Family variables
I = Individual variables

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*For an explanation of the linear probability model, see Pindyck and Rubinfeld (1976).

The results of this original regression analysis indicated that ten of the factor-derived variables were significant predictors of early school leaving (table 2).

Partitioning the Sample

On the basis of the results of previous research (see chapter 1), high school dropouts or potential dropouts have been found to differ from graduates on numerous dimensions. The intent of the present study was to examine the retentive effects of vocational education for those students most likely to drop out; therefore, the decision was made to divide the sample into two groups--those with a high probability of dropping out and those with a low probability.

Based on the assumption that different factors influence persons with low and high probabilities of dropping out, the sample was divided into these two groups by the following method. An OLS regression analysis was run similar to the one used to determine the predictors of dropping out. The variables in this regression included those that were significant in the first regression, the demographic variables, and the "percent of disadvantaged in the school" variable. (This variable was included because none of the school variables were strictly significant, and previous research had indicated that this is an important component.)

The results of the reduced form equation indicated that all of the factor-analysis-derived variables remained significant predictors (except percent of disadvantaged in the school, which was not significant in the initial analysis) (table 2). The adjusted R^2 indicated that 32 percent of the variance was accounted for by this equation.

The next step was to calculate a probability of dropping out for the persons who were sixteen or older and had courses or credits on their high school transcripts for grades nine or ten ($n = 7,416$). The probabilities were calculated by using the regression coefficients from the reduced form equation to predict Y scores for this sample. The predicted probabilities ranged from -.289 to 1.152, with a median of .159. Therefore, individuals with a probability below .159 were defined as low probability dropouts. Those above .159 were defined as high probability dropouts. Subsequent analyses were done separately for each group, based on this distinction.

Effects of Vocational Education on High School Completion

The next step in the analysis was to determine the effect of participation in vocational education on high school completion.

The results of these analyses are reported in chapter 3; therefore, this section contains a description only of the strategy used in the analyses.

The strategy was specifically designed to control for the "net flow" effect that has troubled previous research (Grasso and Shea 1979). A series of OLS and probit regression analyses was run to determine the "retention" effect of vocational education at the tenth, eleventh, and twelfth grades. This strategy controlled for the "net flow" effect by treating the data in a longitudinal manner. Because the effects were examined on a year-to-year basis, the effects of transfers among curricula that occur from tenth to twelfth grade were avoided. Vocational education participation was defined by the number of vocational credits that appeared on the high school transcript at each grade level.

The following regression analyses were conducted:

1. Conditional on completion of ninth grade

$$Y_{10L} = a + b_1X_C + b_2X_S + b_3X_H + b_4X_F + b_5X_I + b_6X_{V9} + b_7X_{VA} + e \qquad (2)$$

and,

$$Y_{10H} = \text{equation (2)}$$

where C, S, H, F, and I are the same as in equation (1).

Y_{10L} = 1 if dropped out after completing the ninth grade and before completing tenth grade, and 0 otherwise--and are in the low probability group

Y_{10H} = 1 if dropped out after completing the ninth grade and before completing tenth grade and 0 otherwise--and are in the high probability group

V9 = amount of vocational education taken in the ninth grade

VA = 1 if vocational education is available, 0 otherwise

2. Conditional on completion of tenth grade

$$Y_{11L} = a + b_1X_C + b_2X_S + b_3X_H + b_4X_F + b_5X_I + b_6X_{V9+10} + b_7X_{VA} + e \qquad (4)$$

and,

$$Y_{11H} = \text{equation (4)} \qquad (5)$$

where the variables are defined the same as in equation (2), except

Y_{11L} = 1 if dropped out after completing tenth grade and before completing eleventh grade, and 0 otherwise--and are in the low probability group

Y_{11H} = 1 if dropped out after completing tenth grade and before completing eleventh grade, and 0 otherwise--and are in the high probability group

V9+10 = amount of vocational education taken in the ninth and tenth grade

3. Conditional on completion of eleventh grade,

$$Y_{12L} = a + b_1X_C + b_2X_S + b_3X_H + b_4X_F + b_5X_I + b_6X_{V9+10+11} + b_7X_{VA} + e \quad (6)$$

and

$$Y_{12H} = \text{equation (6)} \quad (7)$$

where the variables are defined the same as in equation (2), except

Y_{12L} = 1 if dropped out after completing eleventh grade and before completing twelfth grade, and 0 otherwise--and are in the low probability group

Y_{12H} = 1 if dropped out after completing eleventh grade and before completing twelfth grade, and 0 otherwise--and are in the high probability group

V9+10+11 = amount of vocational education taken in the ninth, tenth, and eleventh grade

Labor Market Effects of Dropping Out

The major interest in this analysis lies in the effects of participation in vocational education and high school dropout on labor market experiences. The post-high school labor market experiences of interest included labor force participation, employment, weeks of unemployment, occupational prestige, training-related placement, job satisfaction, and hourly and weekly wage rates. OLS regression analyses were run with these dependent variables. Probit analyses were also conducted for dichotomous dependent variables, i.e., labor force participation, unemployment, and training-related placement. The independent variables were the same as those used in the equations that determined the effects of vocational education on high school completion. In

addition, an interaction variable of vocational education and dropping out, a postsecondary education variable, and labor market variables were included.

Characteristics of the Sample

As was mentioned previously, the subsample of the NLS Youth respondents that was used in this study included those who were sixteen or older and had course or credit information on their transcripts for grades nine or ten. This yielded a sample size of 7,416.

Table 4 presents the breakdown of the sample by high school completion, race, sex, and grade level. The percentages by sex were fairly evenly divided within racial groups in grades ten and eleven (e.g., 41 percent white males and 41 percent white females in grade nine). By grade twelve, slight differences were observed for the white and black subsamples by sex. White males continued to represent about 41 percent of the sample, while white females represented 43 percent. Black males represented 5 percent of the sample in twelfth grade, while the corresponding figure for black females was about 6 percent. Hispanic males and females continued to be represented fairly evenly (i.e., about 2 percent).

The NLS Youth survey oversampled Hispanics and blacks. Therefore, it was necessary to use sampling weights to bring the reduced sample "back into line" and allow it to be generalizable to the target youth population. Consequently, these weights were applied to table 4 and to all subsequent cross-tabulations, unless otherwise noted. Unweighted data were used in the regression analyses.

TABLE 4

DISTRIBUTION OF THE SAMPLE BY EDUCATIONAL STATUS, RACE, SEX, AND GRADE LEVEL

Grade Level	Race/Sex						
	Hispanic Males	Black Males	White Males	Hispanic Females	Black Females	White Females	Total
Grade 10							
Complete %	2.39	5.65	40.55	2.30	6.29	40.78	97.96
n	5,416	12,820	91,961	5,213	14,264	92,486	222,161
Dropout %	.10	.15	.92	.15	.17	.55	2.04
n	238	349	2,083	329	391	1,242	4,632
% of total	2.49	5.81	41.47	2.44	6.46	41.33	100.00
n	5,654	13,170	94,044	5,542	14,655	93,729	226,793
Grade 11							
Complete %	2.13	5.20	39.97	2.05	6.20	40.35	95.90
n	4,106	10,016	77,041	3,947	11,941	77,770	184,821
Dropout %	.26	.47	1.44	.17	.35	1.41	4.10
n	503	906	2,772	332	666	2,727	7,907
% of total	2.39	5.67	41.41	2.22	6.54	41.77	100.00
n	4,609	10,922	79,812	4,280	12,607	80,498	192,728
Grade 12							
Complete %	1.82	4.46	38.92	1.94	5.91	40.97	94.02
n	2,786	6,815	59,532	2,964	9,045	62,669	143,811
Dropout %	.28	.75	2.51	.15	.35	1.93	5.98
n	434	1,146	3,846	236	528	2,956	9,146
% of total	2.10	5.20	41.44	2.09	6.26	42.90	100.00
n	3,220	7,961	63.378	3,200	9,573	65,625	152,957

NOTE: The frequencies (n) represent the weighted population in hundreds.

CHAPTER III

VOCATIONAL EDUCATION AND THE PREVENTION OF HIGH SCHOOL DROPOUT

In general, dropout rates have declined, or high school completion rates have increased, over this century. For persons born before 1913, about 40 percent of whites and 18 percent of minorities completed high school. For those born between 1948 and 1952, the completion rates had increased to approximately 87 percent for whites, 76 percent for blacks, and 58 percent for Hispanics (U.S. Department of Commerce 1977). However, rates varied according to individual school districts. About 45 percent of the students of the New York City public high schools drop out before completing their high school education (New York City Public Schools 1979).

Some studies have shown recent increases in the dropout rate. For example, the dropout rate has been increasing in Wisconsin over the past ten years (Wisconsin Vocational Studies Center 1980). Similarly, dropout rates in Minnesota have increased from 2.89 percent in the 1975/76 school year to 4.28 percent in the 1979/80 school year (Minnesota State Department of Education 1981).

There is considerable variation in dropout rates when comparisons are based on such factors as sex, race, socioeconomic status, and availability of curriculum options. The results of the analysis of the NLS Youth dropout rates by race and sex corresponded to the national trends reported by the U.S. Department of Commerce (1977). The highest dropout rates at each grade level were observed for the Hispanic subsample (except black males in grade twelve) (table 5 and figure 2). Black males had a dropout rate of 14.4 percent in twelfth grade; this was the highest rate for any group at all grade levels. The overall rate of dropping out increased from about 2 percent in grade ten, to 4 percent in grade eleven, to 6 percent in grade twelve.

At each grade level, the dropout rate increased substantially as the respondents' SES decreased (table 6). For example, the grade ten dropout rate was 6.4 percent for low SES respondents and 0.4 percent for those from high SES backgrounds. These findings corroborate those reported in chapter 2 regarding the effect of family SES on dropping out (see Branter and Enderlein 1972; Grasso and Shea 1979; National Advisory Council 1975).

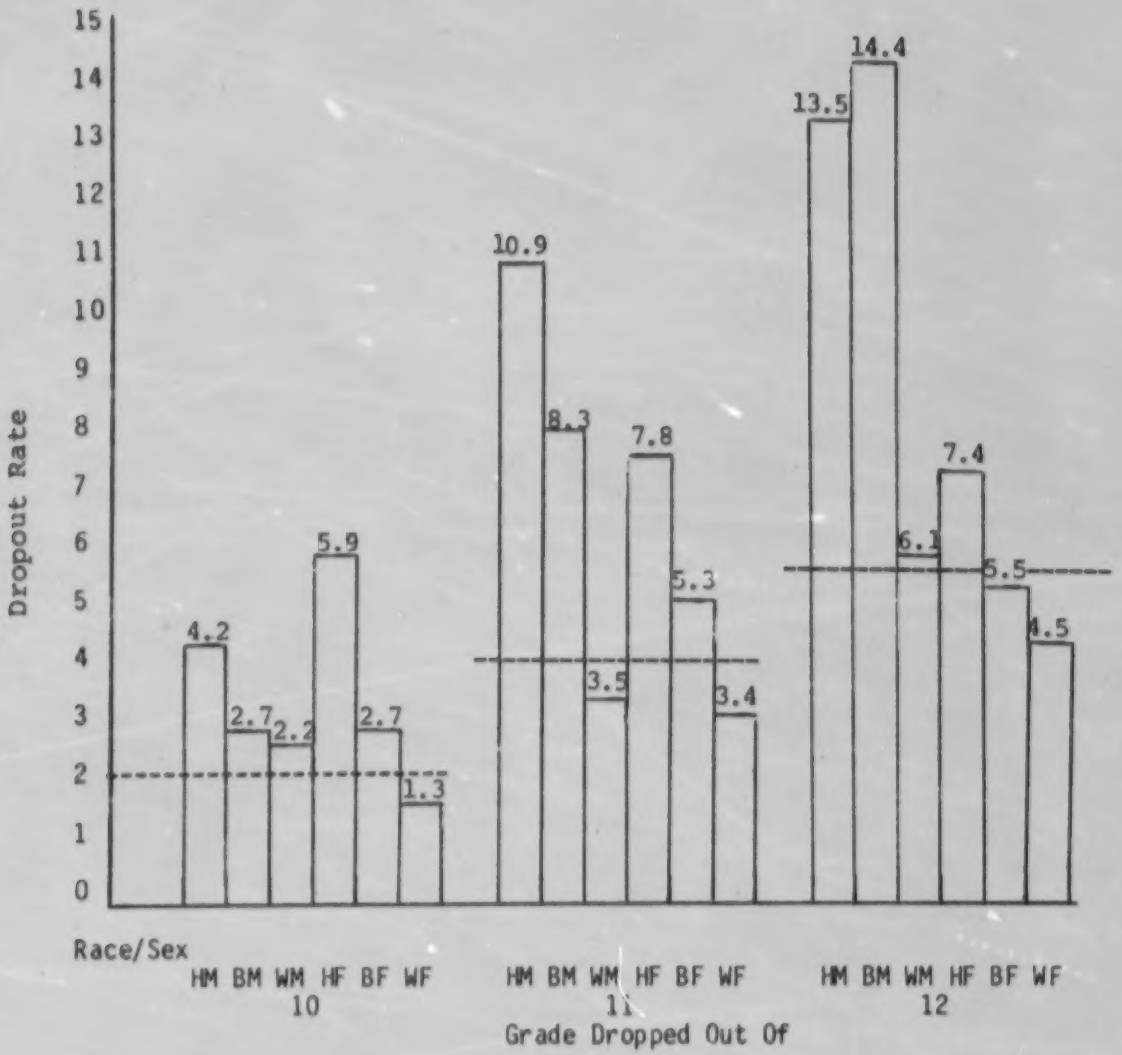
Previous research concerning the relationship between participation in vocational education and tendency to drop out of school has indicated mixed results (Coombs and Cooley 1968; Grasso and Shea 1979; Woods and Haney 1981). Data in table 7 suggest that perhaps a curvilinear relationship exists between the amount of vocational education and dropping out. In grade

TABLE 5

DROPOUT RATE BY GRADE LEVEL, RACE, SEX, AND PROBABILITY OF DROPPING OUT

Race/Sex		Grade Level and Probability of Dropping Out								
		10			11			12		
		Low	High	Total	Low	High	Total	Low	High	Total
Hispanic Male	%	0.0	6.4	4.2	1.1	16.7	10.9	2.0	21.9	13.5
	n	0	238	238	19	484	503	27	408	435
Black Male	%	0.0	4.3	2.7	0.0	14.1	8.3	2.8	24.7	14.4
	n	0	349	349	0	906	906	103	1043	1146
White Male	%	0.1	4.6	2.2	0.2	7.5	3.5	0.5	13.5	6.1
	n	45	2038	2083	67	2705	2772	166	3680	3846
Hispanic Female	%	0.0	10.3	5.9	0.6	13.8	7.8	0.6	13.7	7.4
	n	0	329	329	12	320	332	9	226	235
Black Female	%	0.3	5.5	2.7	0.0	11.9	5.3	0.7	12.2	5.5
	n	20	370	390	0	666	666	41	487	528
White Female	%	0.1	4.0	1.3	0.4	10.2	3.4	0.7	14.1	4.5
	n	64	1178	1242	247	2481	2728	344	2612	2956
Total	%	0.1	4.7	2.0	0.3	9.7	4.1	0.7	14.7	6.0
	n	129	4502	4631	344	7562	7906	689	8457	9146

NOTE: The frequencies (n) represent the weighted population in hundreds.



Key: ------- represents overall average dropout rate by grade level

HM = Hispanic Male

BM = Black Male

WM = White Male

HF = Hispanic Female

BF = Black Female

WF = White Female

Figure 2. Dropout rate by grade level, race, and sex

TABLE 6

DROPOUT RATE BY GRADE LEVEL, SOCIOECONOMIC STATUS, AND PROBABILITY OF DROPPING OUT

SES		Grade Level and Probability of Dropping Out								
		10			11			12		
		Low	High	Total	Low	High	Total	Low	High	Total
Low	%	0.5	9.3	6.4	0.8	18.1	12.0	0.4	17.9	10.9
	n	50	1838	1888	67	2804	2871	25	1864	1889
Mid	%	0.1	3.8	1.9	0.4	9.0	4.4	1.2	15.1	7.4
	n	80	2390	2470	226	4669	4895	580	5885	6465
High	%	0.0	2.2	0.4	0.1	0.9	0.2	0.2	8.8	1.6
	n	0	274	274	51	89	140	83	708	791
Total	%	0.1	4.7	2.0	0.3	9.7	4.1	0.7	14.7	6.0
	n	129	4502	4631	344	7562	7906	689	8456	9145

NOTE: The frequencies (n) represent the weighted population in hundreds.

TABLE 7

DROPOUT RATE BY GRADE LEVEL, PROBABILITY OF DROPPING OUT, AND AMOUNT OF VOCATIONAL EDUCATION

Amount of Vocational Education		Grade Level and Probability of Dropping Out								
		10			11			12		
		Low	High	Total	Low	High	Total	Low	High	Total
No Voc	%	0.1	3.9	1.6	0.0	6.6	2.5	0.7	11.0	4.0
	n	50	2531	2581	23	2028	2051	187	1281	1568
LE 3 credits	%	0.2	6.6	3.0	0.5	11.9	5.4	0.8	16.4	6.8
	n	79	1971	2050	321	5478	5799	502	6248	6750
3+ credits	%	0.0*	-	0.0*	0.0*	7.3	4.5	0.0	12.3	5.6
	n	0	-	0	0	56	56	0	827	827
Total	%	0.1	4.7	2.0	0.3	9.7	4.1	0.7	14.7	6.0
	n	129	4502	4631	344	7562	7906	689	8456	9145

NOTE: The frequencies (n) represent the weighted population in hundreds. The asterisk (*) indicates that fewer than twenty-five actual cases were used as the base for calculation. No Voc = No vocational credits; LE 3 credits = between zero and three vocational credits; and 3+ credits = three or more vocational credits. Respondents with no transcript data for a particular year were assigned to the mean for that grade level.

nine, many students had not had an opportunity to take vocational education, therefore, the number of vocational credits was rather small. The dropout rate in grade ten for respondents with between zero and three vocational credits was higher than for those with no vocational credits. This trend was repeated in grades eleven and twelve. However, two observations should be considered here. First, the dropout rate declined in grades eleven and twelve for persons with more than three vocational credits. However, the rate did not drop below that of persons with no vocational credits. The second observation has to do with the need to control for background characteristics. Crosstabulations do not control for extraneous factors that are known to be associated with dropping out, such as SES, ability level, and educational aspirations. Vocational respondents are known to be lower on these measures than their peers with no vocational education (Campbell, Orth, and Seitz 1981). A comprehensive table in Appendix B depicts dropout rates by sex, race, SES, and grade level.

In order to control for these and other variables, and to get a "purer" sense of the effects of vocational education, OLS and probit regression analyses were conducted. As described in chapter 2, the sample was divided into high and low probability groups based on their predicted probability of dropping out. (The unweighted distribution of the sample is presented in table 8 so that the reader can see the actual frequencies that were entered into the regression analyses.) As would be expected, very small numbers of dropouts were included in the low probability subsample. Consequently, the discussion of the results focuses on the high probability subsample, and the results for the low probability group are displayed in Appendix C.

In the regression results for the high probability group, the vocational education coefficient was negative for all grade levels (tables 9, 10, and 11). This indicates that, all else being equal, the more vocational education people had, the less likely they were to drop out of high school. This relationship was statistically significant in grades ten and twelve; however; the size of the coefficients was small. The effect of obtaining one vocational credit in grade nine was to reduce the probability of dropping out of grade ten by one tenth of a percent. One vocational credit in grade eleven was associated with a .02 percent reduction in the probability of dropping out of grade twelve.

Several hypotheses are suggested by the pattern of significance of vocational education by grade level. Around grade eleven, the majority of students reached sixteen years of age (table 12), the legal age at which they could leave school. It is possible that those who dropped out at this time represent those who "waited out their time." Thus, school-related variables, such as vocational education, may have been of less

TABLE 8

DISTRIBUTION OF THE SAMPLE BY GRADE LEVEL AND PROBABILITY OF DROPPING OUT

Grade Level		Probability of Dropping Out		
		Low	High	Total
Grade 10				
Complete	%	99.8	93.4	96.8
	n	(3732)	(3206)	(6938)
Dropout	%	0.2	6.6	3.2
	n	(6)	(226)	(232)
Total	%	100.0	100.0	100.0
	n	(3738)	(3432)	(7170)
Grade 11				
Complete	%	99.6	87.6	94.2
	n	(3230)	(2348)	(5578)
Dropout	%	0.4	12.4	5.8
	n	(12)	(331)	(343)
Total	%	100.0	100.0	100.0
	n	(3242)	(2679)	(5921)
Grade 12				
Complete	%	99.1	83.8	92.8
	n	(2613)	(1567)	(4180)
Dropout	%	0.9	16.2	7.2
	n	(23)	(302)	(325)
Total	%	100.0	100.0	100.0
	n	(2636)	(1869)	(4505)

Note: Numbers in parentheses represent unweighted frequencies.

TABLE 9

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE TEN HIGH PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	-.02	-2.07**	-.21	-1.96**	-.01
BLACK	-4.82	-4.55**	-43.78	-4.13**	-2.81
SELF	.29	5.78**	2.83	5.55**	.18
MEARLY	3.61	.98	22.18	.73	1.42
LAW	.17	4.90**	1.07	3.56**	.07
TIAVAIL	2.16	1.56	28.70	2.04**	1.84
MLATE	2.54	1.31	32.29	2.02**	2.07
FEMALE	.68	.76	6.77	.79	.43
KIDLATE	7.48	5.76**	61.58	5.33**	3.95
DRUGS	.09	1.94*	.80	1.87*	.05
KIDEARLY	6.05	4.37**	44.71	3.70**	2.87
HISPANIC	.24	.20	-4.98	-.46	-.32
THEFT	.01	.15	-.17	-.50	-.01
HGASPIR2	-2.35	-9.90**	-23.47	-8.24**	-1.50
WOW	-.66	-11.40**	-5.44	-10.08**	-.35
$DISAD	.05	2.44**	.37	2.19**	.02
AGE	-1.09	-4.46**	-12.41	-4.92**	-.80
GPA	-.38	-6.57**	-3.06	-5.47**	-.20
SES	-.18	-3.26**	-1.80	-3.44**	-.12
OFFAVAIL	-4.09	-2.49**	-43.46	-2.77**	-2.79
CONSTANT		51.79	301.03	4.99**	19.29
R^2		.11			
$\overline{R}^2$		.11			
2 times the Log Likelihood Ratio			392.37		
n		3,432	3,432		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 10

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE ELEVEN HIGH PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	-.00	-.24	-.01	-.30	-.00
BLACK	-2.99	-1.95*	-8.40	-.89	-1.19
SELF	.27	3.84**	1.40	3.17**	.20
MEARLY	5.46	1.09	32.94	1.26	4.67
LAW	.36	7.70**	1.57	5.91**	.22
TIAVAIL	-.69	-.35	-2.63	-.21	-.37
MLATE	-4.86	-1.87*	-26.40	-1.52	-3.74
FEMALE	.92	.72	7.16	.89	1.02
KIDLATE	16.98	9.68**	84.68	8.38**	12.00
DRUGS	.16	2.47**	.74	1.85*	.10
KIDEARLY	8.22	4.40**	33.59	3.07**	4.76
HISPANIC	4.03	2.29**	26.31	2.54**	3.73
THEFT	.33	5.84**	1.31	4.35**	.19
HGASPIR2	-4.11	-11.85**	-22.42	-9.18**	-3.18
WOW	-1.14	-13.16**	-5.82	-11.03**	-.83
SDISAD	-.05	-1.84*	-.34	-2.00**	-.05
AGE	-1.81	-4.68**	-11.88	-4.82**	-1.68
GPA	-.52	-6.27**	-2.32	-4.64**	-.33
SES	-.33	-4.09**	-2.10	-4.26**	-.30
OFFAVAIL	-1.70	-.70	-9.12	-.60	-1.29
DAYABIO	.29	5.90*	1.02	3.95**	.14
CONSTANT	86.44		314.23	5.38**	44.55
R^2	.19				
$\overline{R^2}$	.18				
2 times the Log Likilhood Ratio			469.78		
n	2,679		2,679		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 11

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE TWELVE HIGH PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
			Maximum Likelihood		Partial Derivatives
Variable	B	t	Estimate	t	Evaluated at the Mean
VOCCRED	-.02	-3.04**	-.08	-2.94**	-.02
BLACK	.71	.33	3.97	.39	.81
SELF	.40	3.05**	1.16	2.48**	.24
MEARLY	15.59	2.44**	60.71	2.29**	12.33
EAW	.32	5.18**	1.17	4.11**	.24
TIAVAIL	-2.34	-.85	-11.17	-.84	-2.27
MLATE	-1.12	-.36	-.36	-.02	-.07
FEMALE	-3.04	-1.72*	-14.72	-1.69*	-2.99
KIDLATE	-9.67	-4.24**	37.16	3.34**	7.55
DRUGS	.30	3.24**	1.32	3.03**	.27
KIDEARLY	10.21	4.24**	42.49	3.78**	8.63
HISPANIC	3.33	1.35	11.05	.92	2.24
THEFT	-.07	-.80	-.43	-1.00	-.09
HGASPIR2	-4.57	-9.55**	-19.79	-8.21**	-4.02
WOW	-1.43	-11.58**	-6.22	-10.34**	-1.26
SDISAD	-.04	-.96	-.18	-.98	-.04
AGE	-2.80	-4.77**	-13.36	-4.63**	-2.71
GPA	-.53	-4.68**	-2.11	-3.90**	-.43
SES	-.25	-2.32**	-1.29	-2.38**	-.26
OFFAVAIL	1.64	.49	7.87	.48	1.60
DAYAB10	.26	3.19**	.90	2.66**	.18
DAYAB11	.05	.56	.13	.36	.03
CONSTANT	119.43		367.62	5.55**	74.65
R^2	.15				
$\bar{R}^2$	.14				
2 times the Log Likelihood Ratio			281.71		
n	1,869		1,869		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 12

AVERAGE AGE BY GRADE LEVEL, EDUCATIONAL STATUS, AND PROBABILITY OF DROPPING OUT

Status		Grade Level 10	11	12
Completor	$\bar{x}$	15.5	16.5	17.4
	n	217801	179296	136778
Low Probability	$\bar{x}$	15.4	16.4	17.4
	n	129280	112591	92309
High Probability	$\bar{x}$	15.7	16.2	17.6
	n	88520	66706	44469
Dropout	$\bar{x}$	15.9	16.5	17.3
	n	4477	4907	5474
Low Probability	$\bar{x}$	16.2*	16.7*	17.1*
	n	84	242	449
High Probability	$\bar{x}$	15.9	16.5	17.4
	n	4392	4665	5026
Total	$\bar{x}$	15.5	16.5	17.4
	n	222277	184203	142253

NOTE: Age is as of September of the year the respondent entered (or if dropped out in summer, should have entered) the grade level shown. The frequencies (n) represent the weighted population in hundreds.

*Indicates that fewer than twenty-five actual cases were used as the base for calculation.

relevance at this particular age level. They had "come of age," so to speak, and planned to leave school no matter what was offered to them. The variables that attained significance only after completing grade ten included being Hispanic, having engaged in theft, and marrying late. Lack of availability of business and office programs was a unique predictor of dropping out after the ninth grade, and being female and marrying early were unique predictors of dropping out after the eleventh grade. Further research is necessary to determine the influence of school related variables on high school completion for individuals who are legally old enough to leave school.

An examination of the reasons that students dropped out by grade level did not reveal any distinctive pattern that would shed light on this issue (table 13). It was after completing tenth grade that an offer of a good job and financial difficulties increased noticeably as reasons for dropping out. In addition, poor grades was a more frequent reason for dropping out after ninth (9.4 percent) and eleventh (8.1 percent) grades than it was after completing tenth grade (2.4 percent).

Another hypothesis centers on the time at which vocational courses generally became available to students. In many schools, vocational courses were not available until eleventh and twelfth grades. Table 14 reveals the small number of individuals who took vocational education in the ninth and tenth grades. It could be that the type of vocational education available in grade ten was not a strong enough influence to retain individuals who had reached the legal age for leaving school and were starting to feel financial pressures. Ninth grade vocational education may have had a retentive effect for grade ten because the students were younger and not feeling the pressure to work and make money (and many were too young to do so). Eleventh grade vocational education may have had a retentive effect in grade twelve because of the greater variety of vocational offerings available in grade eleven.

Another hypothesis is that the relationship between completion of a grade and vocational education was not linear. This hypothesis was tested by entering a quadratic term (VOC^2) into the regression equations. This variable was not significant for grades ten and twelve. At grade eleven, it was significant. However, what appeared to be a curvilinear relationship was so nearly linear, within the range of vocational credits, that it was well represented by a linear approximation. The turning point on the curve was well in excess of the number of credits that any individual could be expected to have attained (around one thousand), and the degree of curvature was so small within the expected range that, in practical terms, it could effectively be modeled as a linear relationship with little loss of information.

TABLE 13

REASONS HIGH PROBABILITY INDIVIDUALS REPORTED FOR DROPPING OUT OF SCHOOL BY GRADE LEVEL

Reason		Grade Level 10	11	12
Pregnancy	%	10.4	8.6	6.3
	n	462	646	525
Marriage	%	6.5	6.3	9.2
	n	286	468	760
Offered Good Job	%	9.3	12.6	12.2
	n	411	943	1005
Home Responsibilities	%	6.0	3.3	2.4
	n	265	249	196
Financial Difficulties	%	0.5	3.2	4.4
	n	23	238	364
Entered Military	%	1.1	1.5	1.8
	n	50	110	147
Poor Grades	%	9.4	2.4	8.1
	n	418	412	673
Expelled or Suspended	%	5.8	8.9	7.7
	n	259	662	639
School Too Dangerous	%	0.3	1.2	0.8
	n	15	87	64
Didn't Like School for Other Reasons	%	35.8	28.5	24.2
	n	1586	2133	2001
Moved Away from School	%	4.1	3.7	1.0
	n	181	273	82
Other	%	10.6	16.8	21.9
	n	471	1254	1815
Total	%	100.0	100.0	100.0
	n	4429	7476	8271

NOTE: The frequencies (n) represent the weighted population in hundreds; missing observations were excluded.

TABLE 14

MEAN NUMBER OF CREDITS IN VOCATIONAL
PROGRAM AREAS BY GRADE LEVEL AND EDUCATIONAL STATUS
(HIGH PROBABILITY GROUP ONLY)

	Grade 9		Grade 10		Grade 11	
	Completor	Dropout	Completor	Dropout	Completor	Dropout
Agriculture	.06	.08	.12	.10	.16	.21
Distributive Education	.00	-	.01	.00	.07	.07
Health	.00	.00	.00	-	.02	.03
Home Economics	.01	.00	.02	.01	.07	.04
Business & Office	.09	.07	.34	.24	.66	.39
Trade & Industry	.02	.04	.12	.11	.44	.43
Total	.19	.20	.62	.46	1.52	1.18
n	80079	3303	66064	6451	46004	7936

NOTE: The frequencies (n) represent the weighted population in hundreds.

In terms of the model presented in chapter 1, the results revealed several interesting things. First, none of the contextual variables were significant in the earliest versions of the regression analyses (table 2); therefore, they were not included in the regression equations presented here.

The school variables in the equations included the availability of business and office, and trade and industry programs. The availability of a business and office program did not have a consistent effect across grade levels or subsamples. The trade and industry variables tended to have a negative coefficient, suggesting that the availability of a trade and industry program was associated with a low dropout rate.

The peer group component was represented by the "percent disadvantaged in the school" variable. This variable had a positive relationship with dropping out at the tenth grade level and a negative relationship for the eleventh and twelfth grades. This pattern may be an artifact of dividing the sample into high and low probability groups, or, alternatively, it may suggest that dropping out in highly disadvantaged schools occurred earlier rather than later.

The high school experience component was represented by the number of days absent in grades ten and eleven. Statistically significant results indicated a positive relationship between days absent in tenth grade and dropping out for the high probability group in grades eleven and twelve. Thus, these findings confirmed earlier research findings that students who miss a lot of school also have a tendency to drop out.

The family component was represented by the respondent's SES. This variable bore a consistently negative relationship to dropping out, thus indicating that a decrease in SES was associated with an increase in dropping out. Interestingly, this relationship was only statistically significant for the high probability subsample.

The individual component was represented by a number of variables, including age, race, sex, timing of marriage, childbearing (or fathering), and highest grade aspired to. (Age in 1980 was included mainly as a control variable, rather than for explanatory purposes.)

The results for the race variables indicated that being black was associated with a lower dropout rate in grades ten and eleven, but that this trend reversed in grade twelve. This change was a reflection of the sharp rise in dropout rates for black males in grade twelve (from 8.3 percent in grade eleven to 14.4 percent in grade twelve). Being Hispanic, on the other hand, was consistently associated with a higher dropout rate.

This relationship was only significant for the high probability eleventh grade dropouts.

Sex was not found to be a significant predictor of high school dropout until grade twelve for the high probability subsample. The tendency for females to have had a higher dropout rate in grades ten and eleven was reversed in grade twelve. This may account for the results of previous research that reported higher dropout rates for males, since most research has been based on a cross-sectional analysis of dropouts at grade twelve.

Rumberger's (1981) definitions of married early or late and having a child early or late were used. Respondents were considered to have married early if they were married during high school or within two months after leaving high school. Married late was defined as marrying over two months after leaving school; however, the value of this variable was limited by the upper age range of the respondents (i.e., twenty-three years of age). "Child early" was defined as having had a child during high school or within nine months after leaving high school. "Child late" was defined as having had a child over nine months after leaving high school. Early marriage was associated with a high dropout rate, particularly at the twelfth grade level. Delissovoy and Hitchcock (1965) reported that, after marrying, 90 percent of females, but only 33 percent of males, failed to complete high school. Having a child, either early or late, was also associated with a high dropout rate. This relationship was statistically significant for both variables for the high probability group at all grade levels. Thus, this is very strong evidence of the deleterious effect that childbearing (or fathering) could have on high school completion, if the child was born before the parents reached age twenty-three.

The "highest grade aspired to" variable was significantly related to dropping out of high school only for the high probability subsample. The lower the grade aspired to, the more likely the person was to drop out. While previous research would corroborate these findings, a cautionary note is needed due to an artifact of the NLS Youth sampling design. Some of the respondents in the sample had already left high school before they were interviewed. Consequently, their views of "highest grade aspired to" were surely influenced by whether or not they had graduated or dropped out of high school.

The self-esteem measure bore a significant relationship to dropping out of high school only for the high probability group. For these respondents there was a strong relationship, such that low self-esteem was associated with a high tendency to drop out. A causal relationship could not be inferred from this finding in that some of the respondents had already dropped out or graduated from high school when they answered the self-esteem questions.

The three factors related to illegal activities (i.e. theft, involvement with the criminal justice system, and drugs) were all significantly related to dropping out. At the tenth grade level, these were the only significant coefficients associated with dropping out of high school for the low probability subsample. Again, information concerning illegal activities was collected after some of the respondents had left school, and, therefore, a causal relationship could not be assumed.

The final component, cognitive abilities, was represented by two variables--the World of Work (WOW) score and high school grade point average (GPA). The WOW test is an occupational information test that proxies for ability. Griliches (1976) reported that WOW "should reflect both the quantity and quality of schooling, intelligence, and motivation . . . it seems to perform rather similarly (and parallel) to the IQ variable" (p.875). Both WOW and GPA had a significant relationship with dropping out, especially for the high probability group. A low score on WOW and a low GPA were associated with a strong tendency to drop out. This finding corresponded to those reported in numerous other research studies (e.g., Bachman, Green, and Wirtanen 1971; Branter and Enderlein 1972; Minnesota State Department 1981; Novak and Dougherty 1979).

Summary

The determinants of dropping out of high school were varied and complex. For many of the independent variables, a causal relationship could not be assumed (e.g., Did low academic achievement cause low self-esteem or was the opposite true?). Individual, family, and school characteristics, and high school experiences were significantly related to high school completion. The initial model (see figure 1) that guided the analyses in the current study was reexamined to determine its appropriateness in light of the results presented in this chapter. All of the major components in the model, except contextual variables, contained elements that were significantly related to dropping out of high school. It was not clear why the contextual variables were not significant, especially in view of previous research findings on the importance of such factors as place of residence or local unemployment rates (Branter and Enderlein 1972; Minnesota State Department 1981; Rumberger 1981). This appears to be an area in need of further research. The OLS and probit regression techniques yielded similar results, thus, providing evidence of the robustness of the OLS strategy under these conditions. Further implications of these findings are discussed in the final chapter.

CHAPTER IV

LABOR MARKET EFFECTS OF VOCATIONAL EDUCATION AND DROPPING OUT OF HIGH SHCOOL

U.S. Department of Labor (1981) statistics depict the negative labor market experiences of high school dropouts. The unemployment rate for dropouts was more than one and a half times that of youths of the same age who had graduated from high school. King (1978) also documented the well-known labor market problems of the high school dropout, and discussed the difficulty in isolating the causes of these problems. He remarked, "Graduates may achieve a larger degree of labor market success not only because of more schooling, but part or all of their success may also be due to more favorable personal and/or environmental factors that are related both to the likelihood of obtaining schooling and success" (p.1).

In order to control for these personal and environmental factors, ordinary least squares and probit (for dichotomous dependent variables) regression analyses were used to analyze the labor market effects of vocational education. The effects of vocational education, dropping out of school, and the interaction of dropping out of school and vocational education were of primary interest in this study. Previous research with the NLS Youth examined the labor market effects of vocational education for the population of high school graduates (Campbell et al. 1981).

The labor market effects were organized into two broad categories--employment and earnings. The employment variables included labor force participation, unemployment rate, weeks of unemployment, occupational prestige, training-related placement, and job satisfaction. The earnings variables included both hourly and weekly wage rates. The analyses were based on a subsample of the NLS Youth who were not enrolled in school at the time of the 1980 interview. This subsample was selected because the labor market experiences of high school students were influenced by such factors as part-time employment and labor force participation. The analyses were conducted separately for males and females.

Employment Experiences

Labor Force Participation

The labor force participation rates for graduates of both sexes tended to be higher than those of dropouts, and increased participation in vocational education also tended to be associated with higher labor force participation (table 15). The

TABLE 15

LABOR FORCE PARTICIPATION RATE
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM
(IN PERCENTAGE)

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	%	92.2	92.9	96.9	71.7*	65.6	78.5	88.4
	n	457	895	9049	202	677	4651	15929
LE 3 Credits	%	91.4	91.2	96.4	77.1	77.9	85.4	89.4
	n	708	1564	15492	800	1985	16692	37240
3+ Credits	%	92.9	96.8	94.3	91.4	82.8	85.9	89.3
	n	355	930	8120	448	1007	11126	21986
Not Available	%	100.0*	90.9	92.9	61.8	84.8	87.5	89.0
	n	78	426	1349	58*	603	1121	3636
Dropout								
No Voc	%	91.6	89.8	94.1	62.0	45.7	61.1	78.4
	n	558	1108	3399	200	333	1759	7356
LE 3 Credits	%	88.1	84.1	93.7	35.3	52.3	68.9	78.6
	n	316	388	3244	145	238	2036	6367
3+ Credits	%	100.0*	100.0*	100.0*	100.0*	28.2*	92.3*	94.2
	n	20	138	487	13	13	416	1087
Not Available	%	79.9*	81.2	90.7	47.1*	49.8	58.3	74.2
	n	188	468	1234	98	201	450	2639
Total	%	91.4	90.8	95.5	68.8	70.8	81.8	87.0
	n	2679	5917	42374	1963	5055	38250	96239

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.

*Based on less than twenty-five actual cases.

regression results for males indicated that the differences in labor force participation were not significant for dropouts in general, for vocational participants, or for dropouts with vocational training (table 16). The personal factors that were significantly associated with labor force participation (in a negative manner) included involvement with the criminal justice system and being black. A high grade point average and being older were positively associated with being in the labor force. Being from a rural area was a contextual variable that was associated with decreased labor force participation.

For females, the significant negative relationship between dropping out of high school and being in the labor force was only found with the OLS analysis (table 17). Vocational participation and the interaction of vocational education and dropping out were not significantly associated with labor force participation. Childbearing (early or late), marriage (early or late), and being Hispanic were significantly and negatively associated with labor force participation. Labor force participation was positively associated with a high grade point average and having engaged in theft.

Campbell et al. (1981) reported similar results for vocational education from their analyses of high school graduates. They reported that vocational participation was positively, but not significantly, associated with increased labor force participation.

Unemployment

The subsample for the unemployment analyses included only respondents in the labor force at the time of the 1980 interview (n = 2,857). The unemployment rate was determined by dividing the number of those who said they were unemployed and looking for a job by the total labor force subsample. Unemployment rates generally tended to be higher for high school dropouts than for graduates, as well as for nonvocational versus vocational respondents (table 18), but the pattern was not entirely consistent. For males, the regression results confirmed the significance of the effect of dropping out of high school on increased unemployment (table 19). For males, both increased participation in vocational education, and its interaction with dropping out of high school were related to decreased unemployment; however, in neither case was the relationship significant.

A different picture emerged for females, not in terms of direction, but in terms of significance levels of effects (table 20). The OLS analysis resulted in a significant positive relationship between dropping out and unemployment; the probit results were positive but not significant. Increases in vocational education were significantly and negatively associated

TABLE 16

LABOR FORCE PARTICIPATION:
REGRESSION RESULTS FOR MALES BY TYPE OF ANALYSIS

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	.00	.33	.00	.10	.00
DROPBO	-.70	-.28	9.18	.46	1.08
VOCDROP	.02	1.57	.13	1.31	.02
MLATE	1.85	.70	16.83	.69	1.98
WEST	-1.78	-.86	-12.85	-.87	-1.51
MEARLY	7.68	.70	247.51	.27	29.16
KIDLATE	2.39	1.05	22.84	1.13	2.69
DRUGS	.06	.82	.44	.84	.05
SELF	-.06	-.71	-.39	-.69	-.05
THEFT	-.07	-1.27	-.35	-.98	-.04
LAW	-.23	-5.03**	-1.36	-4.72**	-.16
KIDEARLY	3.72	1.19	28.80	1.08	3.39
$GOVT	.01	.25	.04	.24	.00
RURAL	-2.92	-1.76*	-19.88	-1.68*	-2.34
UNEMPR	-.42	-.45	-5.65	-.53	-.42
WOW	-.15	-1.68*	-.85	-1.30	-.10
GPA	.19	2.01**	1.32	1.93*	.16
HISPANIC	-2.37	-1.10	-19.58	-1.29	-2.31
AGESQ	.05	3.92**	-.15	-.09	-.02
SES	-.03	-.31	-.15	-.22	-.02
BLACK	-.04	-2.34**	-31.73	-2.45**	-3.74
SOUTH	1.64	.91	12.36	.91	1.46
NOYRSSCHL	.75	.93	8.36	1.24	.98
$WFG	.00	.11	-.00	-.02	-.00
CONSTANT		65.74	-257.71	-.43	-30.36
R^2		.06			
$\bar{R}^2$		.05			
2 times the Log Likelihood Ratio			95.55		
n		1,645	1,645		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 17

LABOR FORCE PARTICIPATION:
REGRESSION RESULTS FOR FEMALES BY TYPE OF ANALYSIS

	Ordinary Least Squares Regression		Probit Regression		
			Maximum Likelihood		Partial Derivatives
Variable	B	t	Estimate	t	Evaluated at the Mean
VOCORED	.01	1.46	.03	1.61	.01
DROP80	-8.97	-2.41**	-16.00	-1.08	-4.40
VOCDROP	-.00	-.09	-.03	-.54	-.01
MLATE	-10.05	-3.40**	-37.69	-3.42**	-10.38
WEST	1.12	.39	2.98	.26	.82
MEARLY	-17.96	-2.97**	-56.37	-2.64**	-15.52
KIDLATE	-29.68	-12.18**	-95.13	-10.96**	-26.18
DRUGS	.30	2.67**	1.32	2.70**	.36
SELF	-.12	-1.05	-.47	-1.09	-.13
THEFT	.34	1.98**	1.42	1.87*	.39
LAW	.04	.29	.04	.08	.01
KIDEARLY	-12.43	-4.87**	-40.83	-4.53**	-11.24
$GOVT	-.03	-1.23	-.15	-1.38	-.04
RURAL	2.39	1.06	7.66	.87	2.11
UNEMPR	-1.77	-1.36	-6.19	-1.22	-1.70
WOW	.17	1.38	.71	1.50	.20
GPA	.35	2.60**	1.27	2.45**	.35
HISPANIC	-5.98	-1.97**	-20.01	-1.72**	-5.51
AGESQ	.03	2.02**	-.07	-.06	-.02
SES	-.05	-.40	-.19	-.39	-.05
BLACK	-1.20	-.48	-7.04	-.74	-1.94
SOUTH	.26	.10	1.58	.16	.44
NOHSCHL	.82	.79	6.02	1.31	1.66
$AFG	-.01	-.46	-.04	-.51	-.01
CONSTANT	76.14		-47.77	-.10	-13.15
R^2	.18				
$\bar{R}^2$	.17				
2 times the Log Likelihood Ratio			339.56		
n	1,875		1,875		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 18

UNEMPLOYMENT RATE
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM
(IN PERCENTAGE)

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	%	13.6	27.2	10.6	3.1*	30.0	16.7	14.1
	n	62	243	956	6	203	774	2245
LE 3 Credits	%	10.8	20.9	11.3	9.6	23.6	10.8	12.1
	n	77	327	1756	77	469	1810	4516
3+ Credits	%	21.6	18.7	6.0	8.5	18.4	9.9	9.4
	n	77	174	488	38	185	1106	2069
Not Available	%	28.5*	15.5*	24.7	0.0*	30.5	23.6	23.9
	n	22	66	333	0	184	265	870
Dropout								
No Voc	%	37.0	26.1	21.7	33.2*	75.6*	29.5	28.1
	n	206	290	739	66	252	518	2071
LE 3 Credits	%	42.2	21.8*	30.1	18.9*	64.0*	27.8	30.4
	n	133	85	975	27	152	566	1938
3+ Credits	%	52.1*	17.3*	10.1*	0.0*	0.0*	12.4*	12.4
	n	10	24	49	0	0	52	135
Not Available	%	27.6*	27.3	31.5	38.7*	67.6*	48.4*	36.4
	n	52	128	389	38	136	218	961
Total	%	23.9	22.6	13.4	12.9	31.3	13.9	15.4
	n	640	1336	5686	252	1582	5309	14805

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 19

UNEMPLOYMENT: REGRESSION RESULTS FOR MALES
BY TYPE OF ANALYSES

	Ordinary Least Squares Regression		Probit Regression		
			Maximum Likelihood		Partial Derivatives
Variable	B	t	Estimate	t	Evaluated at the Mean
VOCORED	-.01	-1.34	-.03	-1.51	-.01
DROPBO	12.04	3.17**	33.70	2.20**	8.44
VOCOROP	-.01	-.76	-.01	-.22	-.00
MLATE	-11.22	-2.89**	-30.70	-3.13**	-17.70
$GOVT	-.01	-.31	-.05	-.43	-.01
DRUGS	.06	.58	.29	.68	.07
LAW	.14	1.98**	.56	2.08**	.14
HISPANIC	3.61	1.12	15.87	1.25	3.97
KIDEARLY	8.42	1.83*	29.87	1.81*	7.47
UNEMPR	3.24	2.33**	11.93	2.15**	2.99
MEARLY	6.30	.40	22.19	.41	5.55
AGESQ	-.08	-4.38**	1.30	1.01	.33
THEFT	-.11	-1.23	-.42	-1.23	-.11
SELF	.19	1.64	.70	1.49	.18
RURAL	1.99	.80	8.25	.82	2.06
KIDLATE	.53	.16	2.79	.21	.70
WOW	.01	.06	.01	.02	.00
GPA	-.24	-1.68*	-.87	-1.56	-.22
WEST	-7.84	-2.51**	-31.69	-2.48**	-7.93
SES	-.22	-1.56	-.89	-1.65*	-.22
BLACK	3.92	1.44	19.86	1.86*	4.97
SOUTH	-7.60	-2.82**	-30.25	-2.78**	-7.57
NOYRSSCHL	.86	.72	2.24	.44	.56
$MFG	-.02	-1.19	-.10	-1.23	-.02
CONSTANT		38.92	625.55	1.23	156.58
R^2		.09			
$\bar{R}^2$		.07			
2 times the Log Likelihood Ratio			136.05		
n		1,515	1,515		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 20

UNEMPLOYMENT: REGRESSION RESULTS FOR FEMALES
BY TYPE OF ANALYSIS

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	-.01	-1.98**	-.04	-1.86*	-.01
DROP80	14.21	3.38**	19.28	1.05	4.55
VOCDROP	-.05	-2.05**	-.10	-1.07	-.02
MLATE	13.83	4.14**	57.99	4.33**	13.67
$GOVT	-.01	-.28	-.03	-.22	-.01
DRUGS	-.06	-.54	-.10	-.21	-.02
LAW	.35	2.62**	1.23	2.37**	.29
HISPANIC	-5.74	-1.70*	-29.07	-1.82*	-6.86
KIDEARLY	8.06	2.61**	29.84	2.49**	7.04
UNEMPR	1.76	1.26	8.85	1.44	2.09
MEARLY	-8.38	-1.09	-39.77	-1.08	-9.38
AGESQ	-.07	-3.62**	2.29	1.65	.54
THEFT	.10	.57	.14	.21	.03
SELF	.20	1.71*	.82	1.62	.19
RURAL	1.34	.55	6.43	.62	1.52
KIDLATE	11.12	3.61**	45.64	3.75**	10.77
WOW	-.44	-3.21**	-2.03	-3.51**	-.48
GPA	-.15	-.98	-.76	-1.22	-.18
WEST	.70	.23	3.21	.24	.76
SES	.16	1.16	.85	1.38	.20
BLACK	13.70	4.90**	51.05	4.55**	12.04
SOUTH	2.35	.89	10.46	.90	2.47
NOYRSSCHL	-.71	-.65	-6.80	-1.25	-1.60
$MFG	.01	.53	.04	.43	.01
CONSTANT	43.20		1067.09	1.94*	251.63
R^2	.16				
$\bar{R}^2$	.15				
2 times the Log Likelihood Ratio			230.70		
n	1,442		1,442		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

with unemployment. The interaction between vocational education and dropping out was significant and negative for the OLS results, and negative but not significant for the probit results. While the employment experiences of female high school dropouts may have been improved if they participated in vocational education before dropping out, the size of the effect was small.

Numerous personal and contextual variables were also associated with being unemployed. For males, significant negative associations were found between being unemployed and marrying late and living in the South or West. Positive associations with unemployment were found for involvement with the criminal justice system, fathering a child early, and the community's unemployment rate.

For females, being Hispanic and having a high score on the WOW test were positively related to being employed. Positive associations with unemployment were found for childbearing (early or late), marrying more than two months after leaving school, being black, and involvement with the criminal justice system.

Numerous researchers have confirmed the high unemployment rates among dropouts (King 1978; U.S. Department of Labor 1981; O'Malley et al. 1977). Campbell et al. (1981) reported a positive, but not significant, tendency for vocational graduates to experience lower unemployment rates. Based on a combined sample of blacks and Hispanics, they concluded that minority status was significantly associated with being unemployed. The present analyses confirmed this finding for black females; however, the opposite was found for Hispanic females. The positive finding for Hispanic females was suspect, however, because of the small sample size on which it was based.

Weeks Unemployed

The number of weeks of unemployment experienced between the 1979 and 1980 interview provided another perspective of the respondents' unemployment experiences. This measure confirmed the tendency for graduates and vocational participants to experience less unemployment than their peers who either dropped out or did not participate in vocational education (table 21). However, the regression results revealed a different pattern for this measure than was found for the analysis based on unemployment at the time of the interview (table 22). For males, dropping out of high school was significantly associated with more weeks of unemployment. For females, this relationship was in the same direction, but was not significant. However, increased participation in vocational education was significantly associated with fewer weeks of unemployment for females. The interaction between vocational education and dropping out was negative but not significant for both sexes. Very similar patterns of significance were

TABLE 21

NUMBER OF WEEKS UNEMPLOYED BETWEEN INTERVIEWS
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	3.8	8.3	2.9	0.3*	5.6	3.9	3.7
	n	424	955	9148	232	853	5601	17212
LE 3 Credits	x̄	3.6	6.9	3.1	3.3	6.6	3.3	3.5
	n	754	1936	15841	987	2385	18278	39881
3+ Credits	x̄	3.3	8.4	2.8	3.8	6.0	1.9	2.8
	n	358	1001	8437	448	1215	12344	23802
Not Available	x̄	2.0*	7.5	4.6	0.0*	6.5	5.4	5.3
	n	87	421	1453	74	624	1274	3934
Dropout								
No Voc	x̄	9.8	11.4	7.0	2.9	11.3	5.3	7.5
	n	571	1156	3567	314	639	2352	8599
LE 3 Credits	x̄	6.5	10.1	6.3	1.4	7.8*	6.6	6.5
	n	331	445	3347	356	419	2670	7568
3+ Credits	x̄	12.7*	2.9*	3.7*	0.0*	0.0*	2.3*	3.1
	n	20	147	487	13	45	389	1100
Not Available	x̄	10.4*	10.9	6.3	3.5*	13.0*	6.5	7.9
	n	232	502	1346	158	357	694	3288
Total	x̄	5.8	8.6	3.7	2.7	7.0	3.4	4.1
	n	2777	6563	43325	2582	6536	43601	105384

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 22

NUMBER OF WEEKS UNEMPLOYED BETWEEN INTERVIEWS:
REGRESSION RESULTS BY SEX

	Males		Females	
	B	(t)	B	(t)
VOCCRED	-.02	(-.15)	-.25	(-2.19)**
DROP80	302.24	(3.09)**	137.49	(1.54)
VOCDROP	-.18	(-.47)	-.48	(-1.11)
HISPANIC	1.24	(1.51)	-1.48	(-2.04)**
%GOVT	.28	(.34)	.79	(1.19)
DRUGS	1.96	(.74)	1.34	(.50)
KIDEARLY	93.83	(.77)	-85.49	(-1.39)
LAW	4.25	(2.41)**	10.07	(3.47)**
UNEMPR	133.37	(3.77)**	51.71	(1.69)*
MLATE	-176.76	(-1.76)*	-83.38	(-1.21)
AGESQ	-1.24	(-2.69)**	-9.40	(-2.34)**
MEARLY	164.39	(.46)	-3.08	(-2.20)**
THEFT	-3.35	(-1.58)	-1.03	(-.25)
SELF	-4.11	(-1.37)	-2.07	(-.79)
RURAL	-25.15	(-.42)	2.50	(.05)
WOW	-1.14	(-.33)	-7.83	(-2.64)**
KIDLATE	-26.46	(-.30)	-5.06	(-.09)
GPA	-3.25	(-.88)	-1.15	(-.36)
WEST	-237.81	(-3.04)**	1.17	(.02)
SES	-5.59	(-1.59)	.30	(.10)
BLACK	395.52	(5.86)**	327.45	(5.50)**
SOUTH	-104.95	(-1.53)	26.95	(.46)
NOYRSSCHL	-8.80	(-.28)	-10.73	(-.43)
%MFG	.17	(.33)	.70	(1.66)*
Constant	612.62		518.34	
R^2	.09		.08	
$\bar{R}^2$	.07		.06	
n	1,594		1,730	

NOTE: Coefficients were multiplied by 100.

*p<.10
**p<.05

found on the personal and contextual variables for the two measures of unemployment.

Occupational Prestige

The prestige scale used in the present study was developed by Siegel (1971), and was based on ratings of 412 distinct occupational titles obtained from several traditional samples of the population. The scale ranges from 0 to 100, with higher scores indicating higher prestige. According to Siegel, the scale is interval, and the precision of the measurement implies that differences between scores of up to five points are not interpretable. The prestige measures are, therefore, not very reliable for differentiating between occupations that are close together in their social standing. They are, rather, useful for characterizing relations between occupations.

The tendency of vocational participants and high school graduates to have had higher prestige occupations is evident in table 23. The regression results for both men and women confirmed the significant positive relationship between increased vocational education and occupational prestige (table 24). The relationship between dropping out and prestige was positive, but not significant. The coefficients were not significant for the interaction variable for either sex.

For males, being black, fathering a child (early), living in a community with a high unemployment rate, and low self-esteem were significantly associated with lower prestige occupations. A positive relationship was evident between prestige and later marriage, being older, high SES, and increased years of schooling. For females, numerous variables were associated with lower prestige occupations, including childbearing (early or late), low self-esteem, lack of involvement with drugs, percent of government employment in the community, and living in the West or in a rural area. Positive predictors of prestige included high scores on the WOW test, high GPA, being older, high SES, and increased years of schooling.

The positive relationship between occupational prestige and vocational education did not coincide with the findings of Campbell et al. (1981). They reported that the majority of jobs for which vocational education prepared students were of the lowest prestige, based on Siegel's system of determining occupational prestige. However, Redfering and Cook (1980) reported a significant positive correlation between vocational training and job complexity. Mertens and Gardner (1981) also reported a positive relationship between graduation from a business and office program and occupational prestige for females. This appears to be an area in need of further research.

TABLE 23

OCCUPATIONAL PRESTIGE BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	29.9	25.1	32.3	38.8*	34.7	35.8	33.1
	n	426	795	8861	242	577	4726	15626
LE 3 Credits	x̄	31.5	30.1	32.5	34.6	32.1	36.4	34.2
	n	694	1470	14803	834	1642	16465	35908
3+ Credits	x̄	30.2	28.2	34.2	33.5	32.2	37.2	35.3
	n	334	851	8038	445	883	10548	21098
Not Available	x̄	31.1*	27.2*	29.6	33.0*	38.3	31.3	31.4
	n	56	427	1092	58	534	986	3153
Dropout								
No Voc	x̄	24.6	24.6	25.6	23.9*	20.8*	27.3	25.6
	n	434	986	2831	148	166	1429	5994
LE 3 Credits	x̄	28.0	26.8*	27.3	29.5*	27.6*	27.1	27.3
	n	294	348	2750	175	153	1738	5459
3+ Credits	x̄	17.0*	27.0*	36.4*	33.0*	25.0*	28.7*	31.9
	n	9	138	487	13	13	423	1084
Not Available	x̄	21.2*	21.6	32.9	30.5*	20.2*	32.2*	28.8
	n	144	456	937	71	75	306	1989
Total	x̄	28.7	26.8	31.9	33.4	32.4	35.5	33.0
	n	2391	5471	39798	1986	4043	36621	90310

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 24

OCCUPATIONAL PRESTIGE: REGRESSION RESULTS BY SEX

	Males B (t)	Females B (t)
VOCCRED	.45 (3.38)**	.32 (2.11)**
DROP80	91.06 (.88)	42.01 (.32)
VOCDROP	.47 (1.14)	-.26 (-.42)
MLATE	211.16 (2.06)**	-125.36 (-1.27)
%GOVT	1.09 (1.29)	-1.66 (-1.82)*
UNEMPR	-83.86 (-2.20)**	-7.70 (-.18)
DRUGS	.78 (.28)	-10.35 (-2.93)**
HISPANIC	-72.47 (-.81)	100.83 (1.01)
KIDEARLY	-242.55 (-1.91)*	-163.01 (-1.66)
LAW	.77 (.39)	2.19 (.50)
AGESQ	2.35 (4.81)**	1.58 (2.82)**
MEARLY	-409.80 (-.91)	-.41 (-.18)
THEFT	.39 (.17)	-.15 (-.03)
SELF	-6.57 (-2.01)**	-10.49 (-2.93)**
RURAL	-103.00 (-1.52)	-140.14 (-1.89)*
KIDLATE	-64.75 (-.72)	-244.71 (-2.65)**
WOW	3.02 (.81)	13.80 (3.31)**
GPA	5.76 (1.44)	13.56 (2.98)**
WEST	-55.45 (-.65)	-176.93 (-1.94)*
SES	10.41 (2.72)**	6.67 (1.67)*
BLACK	-357.89 (-4.82)**	-36.08 (-.41)
SOUTH	71.54 (.97)	-118.48 (-1.46)
NOYRSSCHL	141.03 (4.31)**	184.03 (5.66)**
%MFG	.71 (1.33)	-.87 (-1.55)
Constant	235.87	1064.38
R^2	.16	.20
$\bar{R}^2$	.14	.19
n	1,399	1,327

NOTE: Coefficients were multiplied by 100.

*p<.10
**p<.05

The nonsignificant relationship between dropping out and prestige also did not coincide with previous research findings. Grasso and Shea (1979) reported that the first jobs of dropouts were inferior to those of graduates. Despite this unequal start, white dropouts caught up to graduates. This was not true for black dropouts, who showed little, if any, progress over the years. Grasso and Shea speculated that the black dropouts start out and remained in the secondary labor market. Doeringer and Piore (1971) characterized the secondary labor market as having "low wages and fringe benefits, poor working conditions, high labor turnover, little chance of advancement, and often arbitrary and capricious supervision" (p.165). The data in the present study did not allow a test of this hypothesis; however, the concept of the dual labor market could be important in future interpretations of the data.

Training-related Placement

The following strategy was used to determine if the respondents' jobs were related to their training. First, if the respondents had one or more credits in vocational education, and at least 60 percent of their credits in one program area (e.g., agriculture), then that was defined as a specialty area. Second, the occupation and industry codes of the most recent job were used to determine if the respondents' occupations and specialty areas were related. The matching was based on a crosswalk between training programs and occupations that was developed by the National Occupational Information Coordinating Committee (1979).*

The percentage of graduates with training-related employment increased as the number of vocational credits increased (table 25). There were too few dropouts with more than three vocational credits to draw any conclusions. The regression results for both males and females confirmed the significant positive relationship between increased vocational education and training-related placement (tables 26 and 27). Campbell et al. (1981) also reported a strong significant relationship between concentration in a vocational specialty area and training-related placement.

Number of years of schooling was negatively related to the dependent variables for both sexes. Percent of manufacturing in

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*The following respondents could not be included in the regression analyses: those without credit data on their transcripts, those without vocational credits, those with vocational credits but no specialty area, those without a current or most recent job, and those without occupation or industry data. The final sample sizes were 650 for males and 833 for females.

TABLE 25

TRAINING-RELATED JOB PLACEMENT
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM
(IN PERCENTAGE)

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
LE 3 Credits	%	44.5	46.3	44.6	54.4	57.7	51.2	48.8
	n	230	545	4569	368	761	7170	13643
3+ Credits	%	70.7	51.4	64.7	65.3	55.4	66.6	64.8
	n	224	423	4689	251	451	6387	12424
Dropout								
LE 3 Credits	%	68.9*	33.8*	55.4	43.6*	27.0*	42.5	49.3
	n	135	66	923	56	25	519	1724
3+ Credits	%	100.0*	54.3*	19.1*	0.0*	-	43.0*	33.7
	n	9	75	72	0	-	119	276
Total	%	57.6	47.5	52.5	56.1	55.5	56.6	54.6
	n	598	1110	10252	675	1237	14196	28067

NOTE: LE 3 Credits = between zero and three vocational credits; 3 + Credits = three or more vocational credits.

*Indicates this is based on fewer than twenty-five cases.

TABLE 26

TRAINING-RELATED PLACEMENT:
REGRESSION RESULTS FOR MALES BY TYPE OF ANALYSIS

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	.05	5.04**	.12	5.02**	.05
DROP80	-6.40	-.56	-17.82	-.59	-7.10
VOCDROP	.00	.01	-.00	-.00	-.00
HISPANICS	7.78	1.15	22.23	1.23	8.86
DRUGS	.04	.17	.10	.18	.04
%GOVT	.06	1.02	.16	1.00	.06
UNEMPR	1.05	.38	2.47	.34	1.00
MLATE	-14.53	-2.11**	-37.87	-2.07**	-15.10
KIDLATE	-7.25	-1.08	-19.45	-1.09	-7.76
LAW	.06	.37	.17	.39	.07
MEARLY	6.01	.26	16.46	.27	6.56
THEFT	-.05	-.29	-.17	-.35	-.07
RURAL	-4.10	-.91	-11.09	-.94	-4.42
GPA	-.17	-.59	-.45	-.58	-.18
KIDEARLY	-6.26	-.72	-15.42	-.67	-6.15
SELF	-.22	-.93	-.62	-.97	-.25
WOW	-.34	-1.23	-.89	-1.21	-.36
AGESQ	.02	.64	1.18	.57	.47
SOUTH	2.31	.44	5.72	.41	2.28
SES	.05	.17	.18	.24	.07
BLACK	-2.93	-.52	-7.83	-.53	-3.12
WEST	5.56	.87	14.63	.87	5.83
NOYRSSCHL	-4.58	-1.84*	-12.50	-1.88*	-4.98
%MFG	.07	1.80*	.20	1.84*	.08
CONSTANT	52.32		466.58	.54	186.01
R^2	.08				
$\bar{R}^2$	.04				
2 times the Log Likelihood Ratio			53.99		
n	650		650		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 27

TRAINING-RELATED PLACEMENT:
REGRESSION RESULTS FOR FEMALES BY TYPE OF ANALYSIS

	Ordinary Least Squares Regression		Probit Regression		
			Maximum Likelihood		Partial Derivatives
Variable	B	t	Estimate	t	Evaluated at the Mean
VOCCRED	.03	3.29**	.08	3.30**	.03
DROPBD	-9.99	-.80	-26.62	-.81	-10.56
VOCDROP	-.04	-.77	-.12	-.90	-.05
HISPANICS	2.27	.38	5.82	.37	2.31
DRUGS	-.21	-.97	-.55	-.98	-.22
$GOVT	-.07	-1.29	-.20	-1.39	-.08
UNEMPR	-3.32	-1.36	-8.96	-1.40	-3.55
MLATE	4.00	.72	11.41	.78	4.52
KIDLATE	-10.00	-1.81*	-22.45	-1.77*	-10.09
LAW	-.00	-.00	.06	.08	.02
MEARLY	-26.70	-1.84*	-85.06	-2.04**	-33.73
THEFT	.01	.03	.03	.02	.01
RURAL	-8.89	-2.00**	-24.16	-2.10**	-9.58
GPA	.20	.73	.57	.80	.23
KIDEARLY	-4.30	-.70	-11.00	-.69	-4.36
SELF	-.07	-.31	-.22	-.38	-.09
WOW	.26	1.00	.66	.95	.26
AGESQ	-.00	-.04	2.37	1.19	.94
SOUTH	-4.51	-.94	-12.22	-.97	-4.84
SES	.23	.96	.60	.95	.24
BLACK	4.23	.78	11.87	.84	4.71
WEST	-6.70	-1.24	-18.05	-1.27	-7.16
NOYRSSCHL	-4.74	-2.30**	-12.87	-2.38**	-5.10
$WFG	-.08	-2.44**	-.22	-2.49**	-.09
CONSTANT	151.22		1237.25	1.52	490.55
R^2	.06				
$\bar{R}^2$	.04				
2 times the Log Likelihood Ratio			55.97		
n	833		833		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

the county was positive for males and negative for females, thus reflecting the types of jobs that male and female graduates typically obtained. Males might have tended to benefit from the presence of manufacturing industries because they typically engaged in more craft and operative jobs, while females tended to be in clerical and service jobs.

Job Satisfaction

A global measure of job satisfaction was used to determine the respondents' overall feelings about their jobs. A low score on this measure indicated higher satisfaction. The overall ratings for graduates by race, sex, and amount of vocational education were similar (table 28). Small sample sizes limited the conclusions that could be drawn for dropouts. The regression results indicated that males with more vocational training were significantly more satisfied with their jobs (table 29). The relationship for all females was in the same direction but it was not significant. For female dropouts, increased vocational training was significantly associated with decreased job satisfaction. The overall difference between dropouts and graduates was not significant for either sex. This finding corresponds to that of O'Malley et al. (1977), who reported no deleterious effect of dropping out on job satisfaction.

A positive relationship between vocational education and job satisfaction was reported by Grasso and Shea (1979) and Mertens and Gardner (1981). Furthermore, Grasso and Shea also reported that white youth were more likely than black youth to express greater job satisfaction. The results of the present study agreed with these findings.

Other variables associated with increased job satisfaction for men included lack of involvement with drugs or the criminal justice system, high self-esteem, low scores on the WOW test, and living in the West or the South. For women, increased job satisfaction was reported for those who lacked involvement in drugs or theft, married late, had high self-esteem, and lived in a rural area or one with less manufacturing.

Earnings

Hourly Rate of Pay

When the mean hourly rate of pay was examined, high school graduates earned more per hour than dropouts, and increases in the amount of vocational education were associated with decreases in hourly wage (table 30). Dropouts with vocational education, however, tended to earn more than dropouts without such training. Regression results for males indicated a positive, but not

TABLE 28

JOB SATISFACTION
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	1.9	1.8	1.9	1.9*	1.9*	1.7	1.8
	n	407	651	8093	195	473	3876	13696
LE 3 Credits	x̄	2.0	2.2	1.8	1.7	1.9	1.7	1.8
	n	631	1237	13806	723	1516	14882	32795
3+ Credits	x̄	1.9	1.9	1.8	1.8	1.9	1.7	1.8
	n	278	756	7632	410	822	10020	19917
Not Available	x̄	1.6*	1.9*	1.7*	1.7*	2.0*	2.1	1.9
	n	56	360	1016	58	419	856	2766
Dropout								
No Voc	x̄	1.9	1.9	1.8	1.5*	2.4*	1.7	1.8
	n	352	819	2672	133	81	1241	5298
LE 3 Credits	x̄	1.8*	2.0*	1.7	1.9*	2.0*	1.9	1.8
	n	183	304	2269	117	86	1470	4429
3+ Credits	x̄	1.0*	1.6*	2.0*	2.0*	2.0*	1.9*	1.9
	n	9	114	438	13	13	364	952
Not Available	x̄	1.8*	2.0*	1.7*	1.1*	2.0*	1.5*	1.7
	n	136	341	845	60	65	232	1679
Total	x̄	1.9	2.0	1.8	1.8	1.9	1.7	1.8
	n	2051	4581	36772	1711	3474	32941	81530

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 29

JOB SATISFACTION:
REGRESSION RESULTS BY SEX

	Males B	(t)	Females b	(t)
VOCCRED	-.02	(-1.70)*	-.00	(-.03)
DROP80	-12.26	(-1.54)	-3.89	(-.38)
VOCDROP	.00	(.04)	.09	(1.71)*
MLATE	-6.84	(-.91)	.19	(2.49)**
%GOVT	-.10	(-1.56)	.10	(1.43)
LAW	.48	(3.16)**	-.27	(-.81)
UNEMPR	-2.45	(-.85)	-1.35	(-.43)
HISPANIC	8.98	(1.31)	2.77	(.37)
DRUGS	.76	(3.54)**	.70	(2.67)**
KIDEARLY	7.10	(.69)	6.83	(.91)
THEFT	22	(1.23)	1.00	(2.38)**
KIDLATE	-7.99	(-1.16)	3.24	(.44)
SELF	.62	(2.48)**	.51	(1.90)*
MEARLY	-7.85	(- 22)	9.87	(.59)
RURAL	8.30	(1.62)	-9.56	(-1.74)*
WOW	.59	(2.06)**	-.04	(-.12)
GPA	.38	(1.22)	.49	(1.44)
AGESQ	.02	(.41)	-.02	(-.59)
WEST	-22.59	(-3.50)**	-2.53	(-.37)
BLACK	.22	(3.90)**	20.03	(3.00)**
SES	-.27	(-.90)	-.40	(-1.34)
SOUTH	-17.80	(-2.98)**	-3.82	(-.64)
NOYRSSCHL	-1.93	(-.78)	1.85	(.78)
%MFG	-.05	(-1.13)	.08	(1.86)*
Constant	244.78		1.28	
R^2	.06		.04	
$\overline{R}^2$	.04		.02	
n	1,230		1,168	

NOTE: Coefficients were multiplied by 100.

*p<.10
**p<.05

TABLE 30

HOURLY RATE OF PAY
BY RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	$5.27	$4.94	$5.44	$4.30*	$3.87*	$4.26	$4.98
	n	426	804	8663	242	577	4567	15277
LE 3 Credits	x̄	4.88	5.24	5.47	3.93	3.80	4.09	4.70
	n	644	1437	14404	812	1614	16344	35255
3+ Credits	x̄	5.44	4.41	5.28	3.80	3.98	3.89	4.47
	n	326	851	7802	435	883	10311	20607
Not Available	x̄	7.08*	4.62*	4.91*	3.69*	3.29	3.55	4.19
	n	56	405	1065	41	497	978	3043
Dropout								
No Voc	x̄	5.17	3.59	4.74	3.82*	3.21*	3.29	4.19
	n	406	976	2843	148	166	1304	5842
LE 3 Credits	x̄	4.57	5.05*	5.07	4.30*	2.72*	3.23	4.37
	n	287	328	2553	168	136	1627	5099
3+ Credits	x̄	4.25*	3.73*	5.02*	5.37*	4.23*	3.61*	4.29
	n	9	138	487	13	13	423	1084
Not Available	x̄	4.98*	3.60	5.19	3.40*	3.62*	2.97*	4.39
	n	131	446	931	71	75	244	1898
Total	x̄	5.10	4.53	5.32	3.96	3.72	3.96	4.61
	n	2285	5385	38747	1931	3960	35797	88105

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

significant, relationship between hourly rate of pay and vocational education (table 31). For male dropouts in general, the relationship was negative. An increase in the amount of vocational education for male dropouts was associated with a higher hourly rate of pay, although the relationship was not significant. Other variables for males that were significantly related to higher hourly earnings included being older, having a child early, being nonblack, and living in a community in the West and in a nonrural area with a low unemployment rate or with a high percentage of manufacturing.

For females in general, an increase in vocational credits was associated with a lower rate of pay, although the relationship was not significant. Female dropouts in general did experience a significantly lower rate of pay. Female dropouts with vocational training received a higher rate of pay, but the difference was not significant. Other variables significantly associated with a higher rate of pay for females included involvement with drugs, being Hispanic, being older, having high self-esteem, and living in a community with a low unemployment rate or a high percentage of manufacturing.

The nonsignificance in the hourly rate of pay for vocational males has been reported by other researchers (Campbell et al. 1981; Grasso and Shea 1979). Mertens and Gardner (1981) reported earnings differences for men by vocational program area and amount of postsecondary education. Male graduates of marketing programs with no college training earned significantly more per hour than their general education peers. For all males, graduates of trade and industry earned significantly more, and those from business and office programs earned significantly less. In that study, both vocational program and postsecondary education were found to be important determinants of hourly wage.

The findings of no significant difference for hourly earnings for vocational females may have resulted from a lack of specification of vocational program area or from insufficient control of postsecondary experiences. Grasso and Shea (1979), Campbell et al. (1981)*, and Mertens and Gardner (1981) reported that female graduates of business and office programs earned significantly more if the sample was restricted to those with exactly twelve years of education. Mertens and Gardner also reported a significant earnings advantage for female graduates of trade and industry programs when the twelve-year educational restriction was not imposed.

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*Finding of Campbell et al. (1981) were based on women who concentrated in vocational education, most of whom were in a business and office program.

TABLE 31

HOURLY RATE OF PAY:
REGRESSION RESULTS BY SEX (IN CENTS)

	Males B (t)	Females B (t)
VOCCRED	.01 (.47)	-.00 (-.09)
DROP80	-12.51 (-.53)	-31.89 (-1.69)*
VOCDROP	.06 (.61)	.08 (.87)
MLATE	13.40 (.57)	8.76 (.62)
UNEMPR	-30.08 (-3.46)**	-23.40 (-3.89)**
%GOVT	.27 (1.40)	.08 (.58)
DRUGS	-.47 (-.72)	1.58 (3.05)**
HISPANIC	-6.01 (-.29)	30.37 (2.13)**
KIDEARLY	97.36 (3.34)**	-11.80 (-.84)
LAW	-.01 (-.03)	.11 (.18)
MEARLY	105.36 (.93)	-17.33 (-.55)
AGESQ	.77 (6.92)**	.36 (4.52)**
THEFT	.32 (.61)	.50 (.63)
SELF	-.81 (-1.09)	-1.26 (-2.46)**
RURAL	-58.87 (-3.80)**	-14.04 (-1.32)
KIDLATE	17.88 (.88)	-19.76 (-1.48)
WOW	-.04 (-.04)	.84 (1.39)
GPA	1.26 (1.38)	-.11 (-.17)
WEST	60.06 (3.06)**	20.02 (1.52)
SES	1.43 (1.63)*	.82 (1.42)
BLACK	-50.88 (-3.01)**	.19 (.02)
SOUTH	17.20 (1.01)	-15.40 (-1.33)
NOYRSSCHL	6.92 (.92)	1.52 (.33)
%MFG	.60 (4.92)**	.16 (1.99)**
Constant	-19.24	233.06
R^2	.13	.09
$\bar{R}^2$	.12	.08
n	1,361	1,293

*p<.10
**p<.05

King (1978) reported that earnings differences were not pronounced between graduates and dropouts immediately upon leaving school, but they became significant over time. The earnings advantage for graduates became significant thirteen years after leaving high school for white men, five years for black men, nine years for white women, and nine years for black women. The findings of the present study suggest that this difference occurred earlier for females. The NLS Youth sample is too young at the present time to determine if King's results for males would be repeated.

Redfering and Cook (1980) reported that vocational education was a more potent influence on income level than was completion of high school. This corresponds to the present study's findings of a positive, but nonsignificant, relationship between higher earnings and dropping out of school with vocational education.

Weekly Rate of Pay

The weekly rate of pay was determined by multiplying the hourly rate of pay by the number of hours worked per week. Because of the obvious influence of the number of hours worked per week on the weekly earnings, the distribution of the sample by amount of vocational education and educational status for the former variable will be examined first.

An increase in the number of vocational credits tended to be associated with an increase in the number of hours worked (table 32). High school graduates also tended to work more hours per week than dropouts. The regression results for men confirmed the significance of the larger number hours for graduates and the smaller hours for nonvocational respondents (table 33). The results for women were in the same direction as the men's, but they were not significant.

The cross-tabulations indicated a tendency for white males' earnings to increase as the amount of vocational education increased, and for white females' earnings to decrease as the amount of vocational education increased (table 34). Overall, dropouts' weekly earnings were less than those of graduates. The regression results for men indicated a significant weekly earnings advantage associated with vocational education (table 35); this was undoubtedly due to the greater number of hours worked by them in contrast to their nonvocational peers. The negative relationships between earnings and dropping out, and earnings and dropping out with vocational training, were not significant. The other variables that were significantly related to weekly earnings were similar to those reported for hourly earnings. Two additional variables that were significantly and positively associated with weekly earnings were a high GPA and high self-esteem.

TABLE 32

HOURS WORKED PER WEEK BY
RACE, SEX, EDUCATIONAL STATUS, AND CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	41.0	38.2	39.8	37.3*	37.4	34.9	38.1
	n	450	878	9174	242	622	5033	16399
LE 3 Credits	x̄	40.5	39.7	41.5	37.7	36.4	35.5	38.3
	n	696	1513	15300	833	1819	17504	37665
3+ Credits	x̄	44.8	39.2	43.0	34.7	36.9	35.9	38.9
	n	345	868	8378	482	978	11061	22112
Not Available	x̄	43.7*	37.5*	42.2	35.0*	35.6	31.2	37.1
	n	56	409	1304	41	573	1087	3470
Dropout								
No Voc	x̄	37.0	35.9	39.5	36.1*	31.8*	35.4	37.4
	n	526	1100	3395	176	243	1670	7110
LE 3 Credits	x̄	42.8	36.9*	43.2	33.7*	29.9*	35.3	39.4
	n	311	372	3157	211	217	2100	6368
3+ Credits	x̄	40.0*	38.6*	39.8*	24.0*	40.0*	29.2*	35.4
	n	20	138	487	13	26	423	1108
Not Available	x̄	37.9*	35.2	38.5	35.6*	39.9*	36.5*	37.3
	n	156	483	1122	80	95	493	2429
Total	x̄	40.6	37.9	41.3	36.2	36.1	35.4	38.3
	n	2559	5760	42318	2079	4574	39372	96661

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 33

HOURS WORKED PER WEEK:
REGRESSION RESULTS BY SEX

	Males B	(t)	Females B	(t)
VOCCRED	.27	(2.02)**	.18	(1.31)
DROP80	-180.43	(-1.73)*	-39.61	(-.33)
VOCDROP	.00	(.00)	-.74	(-1.25)
MLATE	63.03	(.59)	-75.07	(-.82)
WEST	73.29	(.86)	171.66	(2.03)**
KIDEARLY	-82.89	(-.66)	-73.45	(-.81)
LAW	-.61	(-.32)	-1.63	(-.42)
DRUGS	-2.42	(-.85)	2.92	(.88)
AGESQ	1.40	(2.86)**	1.74	(3.34)**
MEARLY	-305.53	(-.65)	339.37	(1.66)*
%GOVT	-.26	(-.31)	-1.14	(-1.35)
RURAL	106.44	(1.56)	88.46	(1.29)
THEFT	-3.36	(-1.47)	5.18	(.99)
UNEMPR	6.83	(.18)	-21.11	(-.54)
SELF	-5.19	(-1.59)	-3.72	(-1.12)
KIDLATE	110.75	(1.22)	-327.64	(-3.88)**
WOW	-2.99	(-.80)	1.34	(.35)
SES	-2.02	(-.53)	-1.62	(-.43)
BLACK	-351.09	(-4.68)**	171.87	(2.12)**
GPA	6.76	(1.70)*	7.67	(1.82)*
HISPANIC	-39.84	(-.44)	109.16	(1.17)
SOUTH	162.99	(2.18)**	162.73	(2.16)**
NOYRSSCHL	-34.92	(-1.05)	-22.78	(-.75)
%MFG	-.13	(-.24)	-.55	(-1.05)
Constant	3892.73		3314.13	
R^2	.06		.04	
$\bar{R}^2$	.04		.03	
n	1,496		1,435	

NOTE: Coefficients were mu'tiplied by 100.

*p<.10
**p<.05

TABLE 34

WEEKLY EARNINGS BY
RACE, SEX, EDUCATIONAL STATUS, ANC CURRICULUM

Educational Status and Curriculum		Race/Sex: Hispanic Male	Black Male	White Male	Hispanic Female	Black Female	White Female	Total
Graduate								
No Voc	x̄	$216.53	$187.55	$216.09	$148.61*	$135.01	$151.17	$191.06
	n	426	804	8663	242	577	4567	15277
LE 3 Credits	x̄	201.95	201.93	227.66	148.93	140.68	149.09	183.97
	n	644	1437	14404	812	1614	16287	35198
3+ Credits	x̄	236.32	173.45	229.36	135.85	151.05	142.19	178.22
	n	326	851	7802	435	883	10311	20607
Not Available	x̄	319.48*	177.89*	201.42*	129.16*	115.41	120.64	159.34
	n	56	387	1065	41	497	978	3024
Dropout								
No Voc	x̄	193.23	134.13	183.10	136.23*	108.52*	118.86	157.98
	n	406	976	2843	148	166	1304	5842
LE 3 Credits	x̄	191.45	170.37*	218.36	152.71*	95.22*	118.91	176.58
	n	287	328	2553	168	136	1627	5099
3+ Credits	x̄	170.00*	158.52*	201.25*	128.85*	169.20*	109.62*	158.49
	n	9	138	487	13	13	423	1084
Not Available	x̄	181.63*	130.38	206.18	126.74*	142.58*	117.65*	169.82
	n	131	446	931	71	75	244	1898
Total	x̄	208.27	172.21	219.96	143.92	136.22	143.43	180.24
	n	2285	5366	38747	1931	3960	35741	88030

NOTE: No Voc = no vocational credits; LE 3 Credits = between zero and three vocational credits; 3+ Credits = three or more vocational credits; Not Available = no transcript was available.
*Based on less than twenty-five actual cases.

TABLE 35

AVERAGE WEEKLY WAGES:
REGRESSION RESULTS BY SEX (IN CENTS)

	Males		Females	
	B	(t)	B	(t)
VOCCRED	2.39	(1.86)*	.79	(.91)
DROP80	-1106.68	(-1.09)	-597.64	(-.78)
VOCDROP	-.98	(-.24)	-1.94	(-.53)
MLATE	1121.79	(1.12)	30.01	(.05)
UNEMPR	-1404.01	(-3.79)**	-766.53	(-3.15)**
%GOVT	13.54	(1.65)*	-4.47	(-.85)
DRUGS	-34.70	(-1.25)	70.21	(3.37)**
HISPANIC	-547.58	(-.62)	1057.14	(1.83)*
KIDEARLY	4033.43	(3.24)**	-741.67	(-1.30)
LAW	-1.97	(-.10)	24.32	(.95)
MEARLY	1788.45	(.37)	177.98	(.14)
AGESQ	35.13	(7.38)**	19.19	(5.92)**
THEFT	4.19	(.19)	24.39	(.77)
SELF	-60.70	(-1.90)*	-54.99	(-2.66)**
RURAL	-1468.68	(-2.22)**	-308.27	(-.72)
KIDLATE	1397.41	(1.60)	-2008.44	(-3.71)**
WOW	-24.13	(-.66)	44.29	(1.83)*
GPA	77.51	(1.99)**	17.11	(.65)
WEST	2996.24	(3.58)**	1195.95	(2.25)**
SES	29.35	(.79)	28.09	(1.21)
BLACK	-3829.13	(-5.30)**	621.11	(1.22)
SOUTH	1026.31	(1.42)	-35.29	(-.08)
NOYRSSCHL	195.74	(.61)	-7.11	(-.04)
%MFG	24.77	(4.73)**	2.34	(.72)
Constant	-1856.22		7921.60	
R^2	.16		.11	
$\bar{R}^2$	.14		.09	
n	1,360		1,292	

*p<.10
**p<.05

For females, the pattern of results for vocational education, dropouts, and earnings was the same as that for males; however, the results were not significant. The other variables that influenced weekly earnings were once again similar to those that influenced hourly earnings. Weekly earnings were depressed for females who had a child late, and were increased for those with high WOW scores or who lived in the West.

Summary

The interaction of vocational education and dropping out of school had a small but significant effect in decreasing job satisfaction for females. It did not have a significant effect on any of the other labor market variables for females, and its effect did not appear to be significant for males on any of the labor market variables. Vocational education for females was significantly associated with higher occupational prestige, lower unemployment at the time of the interview, higher training-related placement, and lower weeks of unemployment in the year between interviews. For males, vocational education was significantly related to higher occupational prestige, higher job satisfaction, greater training-related placement, more hours worked per week, and higher weekly wages. Dropping out of high school was associated with significantly higher unemployment rates for both sexes based on OLS analysis, and only for males based on probit analysis. Female dropouts also experienced a significantly lower hourly rate of pay. Based on OLS analysis, female dropouts experienced significantly less labor force participation. Male dropouts experienced significantly more weeks of unemployment and worked fewer hours per week.

Being black, living in a rural area, or having low self-esteem had a consistently negative relationship with the labor market indicators for both sexes, while being older and living in the West had the opposite effect. Other personal variables that were consistently significant for females, but not for males, included early marriage, late childbearing, involvement with drugs, and being Hispanic. Early marriage did not significantly affect males; however, for females it was associated with lower labor force participation and training-related placement, more hours worked per week, and fewer weeks of unemployment. Having a child early had some similar and some different effects for men and women. Men reported lower prestige jobs, higher rates of weekly and hourly pay, and a higher unemployment rate, while females reported lower prestige jobs, lower labor force participation, and a higher unemployment rate. Males appeared to benefit more from living in a community with a high percentage of manufacturing, and to experience more involvement with the criminal justice system.

The determination of the effects of vocational education is a difficult problem. The model that guided the analyses (see figure 1) appeared to be adequate for describing the labor market effects of vocational education. The number of variables that influenced labor market experiences was quite extensive. Elements of all of the major components (except school variables, which were not included in these analyses) were significantly related to the labor market effects for high school graduates and dropouts.

After controlling for many of these individual, family, contextual, and high school experience factors, no firm conclusions can be drawn concerning vocational education's influence on the one most consistently reported problem of dropouts, i.e., unemployment. Based on OLS, vocational education for female dropouts had a small but significant effect on lowering unemployment rates; for males, the rate was also lower, but not significantly so. The probit analysis did not support the significance of the unemployment effect for female dropouts. This is the only dependent variable for which probit and OLS yielded different results with regard to the effects of vocational education and dropping out of high school. Additional research is needed to further clarify the effects of using OLS versus probit analysis for dichotomous dependent variables.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

Both society and the individual pay a high price for high school dropouts. The higher rate of unemployment experienced by dropouts is costly, in terms of loss of personal income, inaccessibility of a desired lifestyle, foregone taxes, and possibly welfare or prison expenses as well. Because of vocational education's goal to prepare young people for the world of work, it represents one potential means of either retaining students in school who might otherwise drop out or improving the labor market experiences for those who do choose to end their formal education before high school graduation. The purpose of this study was to examine those two issues: (1) the retentive effects of vocational education and (2) its effect on the labor market experiences of high school graduates and dropouts.

The method used to examine these problems consisted of statistical analysis of a set of longitudinal data, the New Youth Cohort of the National Longitudinal Surveys of Labor Market Experience (NLS Youth). This Cohort included a nationally representative sample of 12,686 young people who were fourteen to twenty-one years old in 1978. Their 1979 and 1980 interviews, supplemented by high school transcript information, provided the data for this study.

An explanatory model was developed that provided the conceptual framework for the analyses. The model included five main categories of predictive variables:

- Individual (e.g., self-esteem, illegal activities)
- Family (e.g., mother worked for pay, socioeconomic status)
- Contextual (e.g., percent of county employed in manufacturing, county unemployment rate)
- School characteristics (e.g., availability of vocational education, percent of disadvantaged students in the school)
- High school experience (e.g., days absent, participation in vocational education)

A list of independent variables related to dropping out of high school and labor market experiences was generated based on a literature review (see Appendix A). Factor analysis of subsets of the variables was used to reduce the number of predictive variables that were included in subsequent ordinary least squares

(OLS) regression analyses. Based on the results of the regression analyses, the sample was then split into two groups--those with a high probability of dropping out (above .159), and those with a low probability (below .159). OLS and probit regression analyses were then used to determine the effect of taking vocational education on completion of the next grade level for the two groups, while controlling for many personal and environmental (contextual) variables.

Conclusions

Based on regression results for the high probability group, the vocational education coefficient was always associated positively with school completion. This indicates that, all else being equal, the more vocational education the students took, the less likely they were to drop out of school. This relationship was statistically significant in grades ten and twelve, and negative but not significant for grade eleven. Moreover, the size of the effect was quite small in both grades ten and twelve.

Several hypotheses were explored to examine the meaning of these results. One possible scenario concerns the age of the student and the availability of vocational education. Ninth grade vocational education may have helped retain students in the tenth grade because it offered them an alternative to an academic curriculum in which they have little interest, and the majority of the students were young and not yet feeling financial pressures. Tenth grade vocational education may not have had this strong retentive effect because the majority of the individuals had reached the legal age for leaving school and were starting to feel pressure to work and make money. In addition, most vocational education programs did not become available to students until the eleventh and twelfth grades. It could be that the limited vocational offerings available in the tenth grade were not a strong enough influence to overcome the legal age and financial pressures felt at this time. Eleventh grade vocational education may have had a significant retentive effect for grade twelve because of the greater variety of vocational offerings available in grade eleven.

Regression analysis was also used to examine the effects of vocational education, dropping out of high school, and the interaction of these two elements on labor market experiences in employment and earnings. The interaction of vocational education and dropping out of school had a significant effect on decreasing job satisfaction for females. A significant negative effect was found for unemployment based on OLS analysis, but this result was not confirmed by probit analysis. This interaction did not have a significant effect on any of the other labor market variables for females, and its effect did not appear to be significant for males on any of the labor market variables.

Increases in participation in vocational education for females were significantly associated with higher occupational prestige, lower unemployment at the time of the interview, higher training-related placement, and lower weeks of unemployment in the year between interviews. For males, vocational education was significantly related to higher occupational prestige, higher job satisfaction, greater training-related placement, more hours worked per week, and higher weekly wages. Other than the nonsignificant earnings effect, for females the findings are generally in line with those reported by other researchers (Campbell et al. 1981; Grasso and Shea 1979; Mertens and Gardner 1981). In other studies, females have been reported to earn more per hour if they have had exactly twelve years of education and had graduated from a business and office program. These differences may be accounted for by the fact that vocational program areas were not included in these analyses and postsecondary experiences were controlled by inclusion of the variable "number of years of school." For males, the relationship between higher occupational prestige and vocational participation has not been consistently reported by other researchers.

Based on OLS analysis, dropping out of high school was associated with significantly higher unemployment rates for both sexes. Probit analysis confirmed this effect for males, but not for females. Female dropouts also experienced a significantly lower hourly rate of pay. Male dropouts experienced significantly more weeks of unemployment and work fewer hours per week. Unemployment was the most consistently mentioned problem for the dropout (King 1978; O'Malley et al. 1977; U.S. Department of Labor 1981).

Other personal and contextual variables had significant relationships with labor market variables. Being black, living in a rural area, or having low self-esteem had a consistently depressing effect on the labor market indicators for both sexes, while being older and living in the West had the opposite effect. Other personal variables that consistently influenced females, but not males, included early marriage, late childbearing, involvement with drugs, and being Hispanic. Males appeared to benefit more from living in a community with a high percentage of manufacturing, and to be handicapped more by involvement with the criminal justice system.

Implications

The results of the present study corroborate previous research findings that participation in vocational education is influential in preventing high school dropout. Although the size of the effect is small, this pattern has been consistently reported elsewhere (Coombs and Cooley 1968; Grasso and Shea 1979

[for cross-sectional data]; Perlmutter 1982; Woods and Haney 1981).

Further research is needed to determine if offering a wider variety of vocational education below the eleventh grade level would function to keep students in school who might otherwise drop out. This suggestion is not meant to imply that vocational education by itself is a strong enough intervention strategy to keep the most alienated youth in school. However, it appears to be one ingredient that can make school more palatable for dropout-prone youth.

Individual characteristics appeared to be most influential in the determination of whether or not students would complete high school. A number of these variables suggested possible intervention strategies. The negative influences of early marriage and having children could possibly be affected by parenting education that emphasizes the responsibility involved in such a life choice. Another problem surrounds the interaction of the causal effects of low self-esteem on academic achievement. One route an intervention could take would be to raise students' self-esteem through counseling or other human relations training techniques. Another route would be to provide remedial instructional experiences that could raise the students' academic achievement, and could consequently affect their self-esteem. Dropping out of high school and engaging in criminal behavior are also related to each other in some complex fashion. It is possible that interventions directed at the reduction of criminal behavior would have the effect of reducing high school dropout rates.

Whatever the intervention strategy chosen, the results of previous research concerning dropout prevention programs should be considered. Jones (1973) remarked that the dropout process for youth begins long before they reach the level of secondary education. If the problem is to be reduced, it is important that careful attention be paid to earlier levels of education. However, if students are in the secondary level already, intervention strategies must be devised to help them there. Novak and Dougherty (1979) categorized prevention programs into two types: (1) those that attempt to change the academic program in which the student is enrolled and (2) those that attempt to bring about behavior changes within the student. Some programs combine elements of both.

The literature is replete with examples of programs that have been developed to provide experiences that encourage academic persistence (Adwere-Boamah 1975; Gibboney Associates 1977; Gordon 1972; Hawkes 1974; Johnson 1975). Yates (1979) has suggested that relevancy in learning programs is the issue in "reaching" dropout-prone youth. The adaptation involves the development of training programs that may depart significantly

from traditional forms in content and format. When probed concerning their needs, dropout-prone students have asked for more understanding and sympathetic teachers who render individualized attention, additional counseling, and opportunities to participate in work-study programs.

Boozer and Geiszler (1975) have observed that the majority of students who drop out tend to have been enrolled in a general course of study. According to Novak and Dougherty (1979), when students are able to see demonstrated the importance of the basic skills, an improved learning environment is created. They suggest that vocational education and career education can and do answer students' quests for relevancy. When basic reading, writing, and math skills are incorporated into career labs and vocational/technical programs, the practical demonstration of the relevancy of the basic skills to the mastery of various specialized vocational/technical program areas thus increases the holding power of such programs.

The study entitled Interrupted Education: Students Who Drop Out (Hunt and Woods 1979) has indicated that schools that are effective with potential or actual dropouts share a constellation of features. Among the features identified that have not been mentioned heretofore are the following:

- A commitment from the school leadership that dropout prevention is a priority
- An instructional program that is individually tailored to the learning needs and styles of different students, and advances hierarchically through a sequence of skills
- A grading system that builds on success by connecting it to learning tasks set in accordance with students' achievement levels
- Immediate feedback on performance
- Career information that leads to job placement
- A system of discipline that establishes a bottom line for penalties consistently enforced, rewards for observing rules, and flexibility for students with special circumstances

Prevention programs that are geared to bring about behavioral changes within students focus on the low self-concept that is associated with potential dropouts (Dilenowisco Four I's Project 1973; Project Outreach 1972; Silverman 1978; Thompson 1978). The goals of the programs are achieved primarily through the employment of various techniques and approaches to counseling and

information dissemination. Through counseling, students are assisted in learning to accept authority and cope with anxiety-producing situations and experiences. Opportunities are also provided for students to engage in work activities. In the work setting, potential dropouts can implement the lessons learned through counseling and demonstrate their abilities to function effectively in their daily interactions.

Arising out of the counseling experiences are close relationships between students and their teachers or counselors. Such close relationships encourage the development of the confidence that the students need. It is therefore very important that staff members possess warm, understanding, and creative qualities, among others. In the light of the foregoing, Jones (1973) has noted that selection of staff for such programs is a matter that deserves careful attention.

Thompson (1978) has described a program that is designed to prevent emotionally handicapped students from dropping out of school. This program utilized a systems approach to dropout prevention in recognition of the fact that each student is part of many different systems. The program includes a goal-setting process that utilizes both group and individual counseling. Teachers and parents are involved as a vital part of the process throughout the program's duration. Students are referred to community agencies in cases where such referrals were appropriate.

Nontraditional school settings constitute an alternative to the regular classroom situation (Jones 1973; Novak and Dougherty 1979). There, students may receive the support that they need in facing realities of day-to-day living. When enrolled in educational programs that are removed from the traditional classroom situation, potential dropouts have an opportunity to receive a greater amount of individual attention from teachers and counselors. They also become introduced to specific employment that is compatible with their interests and abilities.

A study of programs for potential dropouts conducted in the state of Wisconsin (Wisconsin Vocational Studies Center 1980) has reported that effective dropout prevention programs must be based on a total and cooperative effort between the community and its educators. Through linkages with community agencies, such as business, industrial, and labor organizations, dropout prevention programs can provide participants with a range of experiences that can be of practical value in the process of the students' transformation into industrious and contributing citizens.

A U.S. Department of Labor (1980) report has suggested that prevention programs that have well-developed community networks tend to be effective in reaching disadvantaged out-of-school youth. The programs that work best are those that appear to be influenced by organizations within the community that are known

for their distinct self-help ideology. Such programs have special appeal to minority youth who are alienated.

Tate (1974, p. 8) has reported that dropouts, when asked about ways in which their high schools could make it easier for people who leave school early (dropouts) to handle the problems that they face, ranked the following actions as very helpful:

- Advise on typical jobs for early leavers
- Teach how to get a job
- Teach how to get along with employers and employees
- Advise on further job training
- Advise on personal budgeting
- Stress practical reading and math
- Provide individual counseling

Finding and holding jobs are two major tasks that dropouts soon find they need to accomplish. These two areas are, of necessity, of special concern in programs that intend to address the problem of dropping out.

Whether school-based or community-based, successful programs for dropouts should include information relative to employment and paid work experiences. These prepare participants for the realities of the world of work. Basic skills development is needed for successful participation in any area of employment. Remediation in the basic skills is therefore a vital part of the preparation of early school leavers for employment. As the Study of Programs for Potential Dropouts (Wisconsin Vocational Studies Center 1980) suggests, other characteristics include (1) flexibility in the design of programs so as to be responsive to the varying needs of the users, and (2) the implementation of support services through individualized counseling and out-of-school learning experiences.

For many students who leave school before graduation, there is an indication that school experiences are not sufficiently positive to hold them. Experimental programs conducted in the schools do show, however, that there are things that the schools can do to reduce the numbers who leave. Efforts made to effect improvements in understanding between teachers and students contribute to tolerance, which aids students' persistence. When held in locations that are less structured than regular schools, where less time is spent in school and some time is spent in work, dropout-prone students show gains in attendance and achievement.

Need for Additional Research

While the present study provides new insights into the relationship between vocational education and dropping out of high school, many questions remain unanswered. The reliance on statistical analysis of an existing data base inherently limits the type of insights that can be obtained. Case studies involving the retentive effects of vocational education and the labor market effects of vocational education for graduates and dropouts would provide a different picture that could explore the dynamics involved.

Experiments could be designed to determine the effect of interventions of all types, including the provision of vocational education at earlier grade levels. What types of student would be helped by this type of intervention? What combination of alternative strategies would be most effective? What types of intervention would best facilitate the return to school of those who have already dropped out?

Other areas in need of further research include investigations of: (1) the relationship between OLS and probit analysis for dichotomous dependent variables, (2) the causal relationship between self-esteem and high school completion, and between criminal activities and high school completion; (3) the effects of self-selection bias in "effects" research; (4) the use of causal modeling techniques to examine this issue; (5) the effects of contextual variables on dropping out; (6) the longitudinal effects using the High School and Beyond data base; (7) the effects of school characteristics on dropping out of high school and labor market experiences; (8) the "secondary labor market" phenomenon; and (9) the contributors to job satisfaction.

The federal government could provide leadership by supporting research, practices, and technical assistance for the purpose of improving the educational and employment experiences of youth most likely to drop out of high school. State and local educators could benefit from such leadership in the planning and implementation of programs for this high-risk group of our nation's youth.

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APPENDIX A

RESULTS OF FACTOR ANALYSES USED TO REDUCE THE NUMBER OF PREDICTIVE VARIABLES

TABLE 1A

FACTOR LOADINGS OF DEMOGRAPHIC VARIABLES

Variables	Factor 1	Factor 2	Factor 3	h^2
Median school years	.76	-.00	-.08	.59
Median family income (whites)	.88	.08	.26	.85
Median family income (blacks)	.68	.17	.25	.56
Percent urban population*	.77	-.11	.02	.60
Percent expenditures for education	-.39	.01	.13	.17
Reside in North West*	.18	-.20	.74	.62
Reside in North Central*	.15	.97	-.15	.98
Reside in West	.27	-.37	-.44	.41
Eigenvalue	2.74	1.18	.85	
Percent of variance	57.40	24.80	17.90	

*Indicates variables used in subsequent regression analyses.

TABLE 2A

FACTOR LOADINGS OF LABOR MARKET VARIABLES

Variables	Factor 1	Factor 2	h^2
Percent employed in manufacturing*	-.79	-.61	.99
Percent employed in wholesale	.76	-.02	.59
Percent employed in services	.75	.18	.59
Percent employed in educational services	-.01	.57	.32
Percent employed in construction	.59	.18	.39
Percent employed in government*	.17	.91	.86
Unemployment rate	-.16	.02	.03
Eigenvalue	2.78	.99	
Percent of variance	73.70	26.30	

*Indicates variables used in subsequent regression analyses.

TABLE 3A

FACTOR LOADINGS OF SCHOOL VARIABLES

Variables	Factor 1	Factor 2	h^2
Student/teacher ratio	.03	.18	.03
Number of students in school*	.04	.95	.91
Number of library books	.01	.31	.10
Agriculture courses available in school	.46	-.17	.24
Office courses available in school*	.80	-.00	.64
Distributive education courses available in school	.62	.21	.44
Health courses available in school	.59	.09	.35
Home economics courses available in school	.80	-.01	.65
Trade and Industry courses available in school*	.85	.03	.72
Technical courses available in school	.65	.07	.43
Number of Full Time Equivalent counselors	.02	.80	.64
Number of teachers	.05	.90	.82
Public/private school	-.24	-.14	.08
Eigenvalue	3.54	2.49	
Percent of variance	58.70	41.30	

*Indicates variables used in subsequent regression analyses.

TABLE 4A

FACTOR LOADINGS OF PEER VARIABLES

Variables	Factor 1	Factor 2	h^2
Percent dropouts	.45	-.11	.22
Percent Hispanic students	.28	.09	.09
Percent black students	.39	.53	.43
Percent white students	-.58	-.48	.57
Percent disadvantaged students*	.68	.16	.49
Percent daily allowance	-.19	-.14	.06
Percent female students	-.01	.15	.02
Eigenvalue	1.61	.25	
Percent of variance	86.40	13.60	

*Indicates variables used in subsequent regression analyses.

TABLE 5A

FACTOR LOADINGS OF TEACHER VARIABLES

Variables	Factor 1	Factor 2	Factor 3	h^2
Percent teachers with advanced degrees	-.01	.37	.02	.14
Percent faculty Native American	-.00	.01	.05	.00
Percent faculty Asian	-.03	.07	.30	.10
Percent faculty Hispanic*	.04	-.30	.62	.48
Percent faculty black*	.90	.17	-.13	.85
Percent faculty white	-.88	-.06	-.34	.89
Percent faculty female	.35	-.14	-.16	.17
Percent faculty left at end of school year*	.01	-.48	.07	.23
Annual salary for beginning teachers	.04	.50	.17	.28
Eigenvalue	1.75	.82	.59	
Percent of variance	55.50	25.90	18.60	

*Indicates variables used in subsequent regression analyses.

TABLE 6A

FACTOR LOADINGS OF HIGH SCHOOL EXPERIENCE VARIABLES

Variables	Factor 1	Factor 2	Factor 3	Factor 4	h^2
Number of days absent--grade 9	.03	.13	.57	.01	.34
Number of days absent--grade 10*	.03	.34	.66	-.01	.55
Number of days absent--grade 11*	.03	.75	.28	-.01	.64
Number of days absent--grade 12	.01	.56	.16	-.00	.34
Remedial English taken*	.80	.00	.10	.08	.66
Remedial math taken	.78	.00	.08	.10	.62
English as a second language*	.06	-.01	.03	.59	.36
Bilingual education	-.04	-.01	-.02	.57	.33
Transcript shows Educable Mentally Retarded class	.16	-.00	-.00	-.02	.02
Transcript shows vocational preparation class	.10	.07	-.05	-.02	.02
Eigenvalue	1.63	1.25	.66	.34	
Percent of variance	42.00	32.30	17.00	8.70	

*Indicates variables used in subsequent regression analyses.

TABLE 7A

FACTOR LOADINGS OF FAMILY VARIABLES

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Live in public housing	-.04	.00	-.07	.71	-.09	-.01
Receive rent subsidy	-.03	.03	-.04	.61	-.08	.00
Frequency of religious attendance (1979)	-.01	.02	.01	.01	.01	.09
Received magazines, age 14**	.23	-.04	.48	-.08	.13	.13
Received newspapers**	.20	-.02	.56	-.05	.09	.10
Had library card**	.14	-.03	.40	-.01	.07	.05
Mother works for pay*	.03	-.68	.04	-.01	.04	-.06
Father works for pay	.07	.01	.15	-.17	.15	.46
Mother worked (1979)	-.14	.74	-.03	.02	-.07	.01
Father worked (1979)	-.24	.09	-.01	.04	-.10	-.48
Total net family income	.15	-.01	.13	-.08	.51	.19
Highest grade completed, mother**	.80	-.11	.26	-.06	.12	-.00
Highest grade completed, father**	.65	-.03	.28	-.04	.14	.08

TABLE 7A
(Continued)

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	h^2
Number of siblings	-.29	.18	-.19	.09	-.15	-.06	.19
Highest grade completed, oldest sibling	.25	-.01	.19	-.03	.03	.10	.11
Language other than English, age 14	-.33	.03	-.05	-.01	-.02	.06	.12
Family in poverty	-.10	.12	-.14	.14	-.64	-.16	.50
Dropout due to financial difficulty	.01	-.00	-.02	-.00	-.01	-.05	.00
Eigenvalue	2.82	1.02	.92	.59	.36	.28	
Percent of variance	47.10	17.00	15.30	9.80	6.00	4.70	

*Indicates variables used in subsequent regression analyses.
**Indicates variables included in composite SES variable.

TABLE 8A

FACTOR LOADINGS OF INDIVIDUAL VARIABLES

Variables	Factor 1	Factor 2	Factor 3	h^2
Satisfied with school	.10	.00	-.02	.01
Highest grade like to complete*	.90	.09	.20	.85
Highest grade expect to complete	.90	.08	.19	.85
Highest grade friend like to complete	.60	.03	.23	.41
Desire additional training	-.15	.03	.01	.02
Expect to be in school in 5 years	.54	.11	-.39	.46
Expect to be married in 5 years	-.03	-.64	.23	.47
Age expect to marry*	.03	.76	-.01	.57
Military expectations	.04	-.05	.17	.03
Eigenvalue	2.38	1.03	.27	
Percent of variance	64.70	28.00	7.30	

*Indicates variables used in subsequent regression analyses.

TABLE 9A

FACTOR LOADINGS OF SCHOOL ATTITUDE VARIABLES

Variables	Factor 1	Factor 2	Factor 3	h^2
Friends made easily	.29	.03	-.19	.12
Teachers willing to help	.43	.16	-.11	.22
Classes boring	-.11	-.27	.27	.16
Do not feel safe*	-.08	-.04	.60	.37
Teachers know subject well	.37	.29	-.12	.23
Can get away with anything*	-.04	-.55	.11	.32
School work requires thought	.26	.48	.05	.30
Free to pursue own interests	.52	.13	-.05	.28
Offers good job counseling*	.56	.07	-.03	.32
Eigenvalue	1.51	.42	.39	
Percent of variance	65.10	17.90	17.00	

Scale: 1 = very true; 4 = not true at all

*Indicates variables used in subsequent regression analyses.

TABLE 10A

FACTOR LOADINGS OF SELF-ESTEEM VARIABLES

Variables	Factor 1	Factor 2	h^2
Person of worth	.68	-.11	.48
Have good qualities	.71	-.16	.53
Feel like a failure	-.53	.39	.43
Not much to be proud of	.59	-.20	.38
Have positive attitude	-.51	.35	.39
Satisfied with self	.54	-.35	.41
Want self-respect	.44	-.32	.29
Feel useless	-.26	.45	.27
Think I am no good	-.14	.71	.53
Think I am as capable as others	-.22	.73	.59
Eigenvalue	3.60	.71	
Percent of variance	83.40	16.60	

Scale: 1 = strongly agree; 4 = strongly disagree

TABLE 11A

FACTOR LOADINGS OF ROTTER VARIABLES

Variables	Factor 1	Factor 2	Factor 3	Factor 4	h^2
Pair 1 Statement A	.59	-.09	.15	.04	.39
Pair 1 Statement B	.43	.22	.08	.03	.24
Pair 2 Statement A	.14	-.07	.12	.37	.18
Pair 2 Statement B	-.06	.15	.02	.40	.19
Pair 3 Statement A	.06	-.04	.49	.02	.25
Pair 3 Statement B	.08	.26	.38	.07	.23
Pair 4 Statement A	-.11	-.07	-.23	-.09	.08
Pair 4 Statement B	.04	.57	.07	.06	.34
Eigenvalue	.88	.46	.30	.24	
Percent of variance	46.50	24.50	16.00	13.00	

TABLE 12A

FACTOR LOADINGS OF ILLEGAL ACTIVITIES VARIABLES

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	h^2
Number of times damaged property	.51	.09	.14	.32	.07	.40
Number of times fought at school/ work	.30	.09	.05	.58	.08	.44
Number of times shoplifted	.55	.08	.29	.17	-.01	.42
Number of times stole goods < $50	.59	.09	.20	.12	.07	.42
Number of times stole goods > $50	.58	.14	.00	.08	.32	.47
Number of times used force to get get something	.24	.07	-.01	.24	.39	.28
Number of times threatened to, or hit	.20	.09	.14	.66	.07	.51
Number of times attacked w/intent to injure	.17	.08	.05	.51	.33	.41
Number of times smoked marijuana	.19	.14	.67	.12	-.03	.52
Number of times used other drugs	.17	.11	.74	.05	.16	.61
Number of times sold marijuana	.20	.11	.59	.10	.35	.54
Number of times sold hard drugs	.12	.05	.26	.01	.46	.30

TABLE 12A
(Continued)

FACTOR LOADINGS OF ILLEGAL ACTIVITIES VARIABLES

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	h^2
Number of attempts to con someone	.34	.04	.13	.28	.14	.23
Number of times took auto without permission	.31	.04	.10	.17	.14	.16
Number of times broke into a building	.61	.12	.07	.14	.26	.48
Number of times held stolen goods	.56	.12	.17	.19	.25	.45
Number of times aided in gambling	.15	.05	.05	.12	.32	.15
Total income from illegal activities	.28	.10	.26	.17	.27	.26
Charged with breaking the law	.14	.80	.12	.11	.01	.69
Ever referred for counseling	.15	.40	.13	.09	.01	.21
Ever convicted in adult court	.01	.69	.03	-.01	.11	.49
Ever charged in adult court	-.01	.83	.04	.01	.07	.70
Ever on probation	.16	.63	.07	.11	.06	.44
Eigenvalue	5.41	1.94	1.08	.62	.51	
Percent of variance	56.60	20.30	11.30	6.50	5.40	

TABLE 13A

FACTOR LOADINGS OF COGNITIVE VARIABLES

Variable	Factor 1	Factor 2	h^2
GPA - English	.22	.87	.81
GPA - Math	.15	.72	.54
Knowledge of the World of Work			
- Hospital orderly	.25	.07	.07
- Department store buyer	.39	.16	.18
- Keypunch operator	.36	.10	.14
- Forklift operator	.42	.04	.18
- Medical illustrator	.38	.14	.16
- Machinist	.43	.04	.19
- Dietitian	.43	.18	.22
- Economist	.43	.11	.20
- Assembler	.44	.09	.20
Eigenvalue	2.11	.77	
Percent of variance	73.20	26.80	

APPENDIX B

DROPOUT RATE BY GRADE LEVEL, AMOUNT OF VOCATIONAL EDUCATION, SES, RACE, AND SEX

TABLE 18

DROPOUT RATE BY GRADE LEVEL, AMOUNT OF VOCATIONAL EDUCATION, SES, RACE, AND SEX
(IN PERCENTAGES)

	DROPOUT 10TH GRADE LOW SES			DROPOUT 11TH GRADE LOW SES			DROPOUT 12TH GRADE LOW SES		
	NoVoc	LE 3	3+	NoVoc	LE 3	3+	No Voc	LE 3	3+
Male	5.4 (448)	11.1 (640)	- (-)	11.8 (444)	14.1 (1040)	30.3* (16)	17.6 (247)	17.1 (916)	21.1 (256)
Female	4.8 (507)	6.1 (292)	- (-)	5.9 (241)	13.4 (1130)	0.0* (0)	1.8 (26)	6.2 (415)	2.2 (28)
Hispanic	6.7 (198)	6.3 (115)	- (-)	5.4 (67)	13.5 (328)	0.0* (0)	11.0 (63)	14.7 (267)	0.0 (0)
Black	3.6 (157)	4.4 (120)	- (-)	7.2 (178)	11.5 (380)	0.0* (0)	9.9 (100)	13.2 (388)	16.0* (49)
White	5.2 (600)	11.6 (697)	- (-)	10.7 (440)	14.5 (1462)	10.5* (16)	8.7 (111)	9.3 (677)	12.7 (235)
Total	5.1 (955)	8.8 (933)	- (-)	8.7 (685)	13.7 (2170)	5.9* (16)	9.6 (274)	11.1 (1332)	11.4 (284)
	MID SES			MID SES			MID SES		
Male	1.6 (684)	3.5 (701)	0.0* (0)	2.7 (691)	7.0 (1949)	4.9* (32)	7.0 (831)	10.0 (2565)	5.8* (249)
Female	1.6 (753)	1.6 (333)	- (-)	3.4 (612)	4.2 (1604)	3.6* (8)	6.4 (405)	6.7 (2168)	3.9 (248)
Hispanic	4.4 (138)	5.7 (98)	- (-)	6.8 (113)	13.2 (301)	62.8* (17)	9.1 (58)	14.2 (275)	0.0 (0)
Black	2.1 (244)	3.8 (219)	0.0* (0)	4.6 (276)	8.4 (723)	9.5* (15)	4.8 (108)	11.9 (896)	6.1 (75)
White	1.4 (1055)	2.2 (717)	0.0* (0)	2.6 (913)	4.6 (2529)	1.2* (8)	7.0 (1069)	7.3 (3562)	4.6 (422)
Total	1.6 (1437)	2.5 (1033)	0.0* (0)	3.0 (1302)	5.3 (3553)	4.6 (40)	6.8 (1235)	8.1 (4733)	4.7 (497)

TABLE 1B
(Continued)

	DROPOUT 10TH GRADE HIGH SES			DROPOUT 11TH GRADE HIGH SES			DROPOUT 12TH GRADE HIGH SES		
	NoVoc	LE 3	3+	No Voc	LE 3	3+	No Voc	LE 3	3+
Male	0.7 (190)	0.1 (7)	- (-)	0.0 (0)	0.1 (9)	0.0* (0)	0.4 (50)	2.4 (312)	0.0* (0)
Female	0.0 (0)	0.8 (77)	- (-)	0.5 (63)	0.4 (67)	0.0* (0)	0.1 (8)	2.4 (374)	4.4 (47)
Hispanic	0.0 (0)	3.9 (18)	- (-)	0.0 (0)	1.7 (9)	- (-)	0.0 (0)	1.5 (7)	0.0* (0)
Black	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	5.1 (40)	1.3 (18)	0.0* (0)
White	0.4 (190)	0.4 (66)	- (-)	0.2 (63)	0.3 (67)	0.0* (0)	0.1 (19)	2.5 (661)	3.4 (47)
Total	0.4 (190)	0.5 (84)	- (-)	0.2 (63)	0.3 (76)	0.0* (0)	0.3 (59)	2.4 (686)	3.1 (47)

Total Percentage Dropout at Each Grade Level

2.0 (4632)	4.1 (7907)	6.0 (9145)

NOTE: The numbers in parentheses represent the weighted population in hundreds. The individual cell values may not sum to the totals due to rounding.

*Indicates less than twenty-five actual cases were used as the base for calculation.

APPENDIX C

PREDICTORS OF HIGH SCHOOL DROPOUT: REGRESSION RESULTS BY GRADE LEVEL AND TYPE OF ANALYSIS FOR THE LOW PROBABILITY GROUP

TABLE 1C

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE TEN LOW PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	.00	1.46	.45	.93	.18
BLACK	-.28	-1.47	-75.40	-.13	-.00
SELF	-.00	-.38	-1.06	-.38	-.00
MEARLY	-.20	-.18	-215.94	-.01	-.00
LAW	.09	5.47**	9.07	3.19**	.00
TIAVAIL	-.13	-.58	7.14	.11	.00
MLATE	.44	1.44	1.59	.02	.00
FEMALE	.25	1.81	82.92	1.25	.00
KIDLATE	.04	.10	-150.71	-.01	-.00
DRUGS	.03	3.38**	4.40	2.39**	.00
KIDEARLY	-.04	-.08	-212.38	-.01	-.00
HISPANIC	-.39	-1.65	-397.13	-.07	-.00
THEFT	.03	2.79**	2.92	1.52	.00
HGASPIR2	.05	1.11	-12.67	-.78	-.00
WOW	-.01	-1.46	-10.30	-2.07	-.00
%DISAD	.00	.87	.51	.55	.00
AGE	-.09	-2.49	-29.36	-1.85*	-.00
GPA	-.02	-1.81	-8.81	-2.19**	-.00
SES	-.01	-1.43	-4.19	-1.47	-.00
OFFAVAIL	.31	1.19	401.39	.09	.00
CONSTANT	1.13		-43.30	-.01	-.00
R^2	.02				
$\overline{R}^2$	.01				
2 times the Log Likilhood Ratio			41.76		
n	3,738		3,738		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 2C

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE ELEVEN LOW PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	-.00	-.14	-.04	-.27	-.00
BLACK	-.69	-2.24**	-348.90	-.23	-.06
SELF	.01	.77	1.89	1.24	.00
MEARLY	-.63	-.39	-128.09	-.28	-.05
LAW	.02	.99	3.20	1.63	.00
TIAVAIL	-.71	-1.97**	-54.84	-1.82	-.01
MLATE	.75	1.59	33.26	.91	.01
FEMALE	.26	1.12	31.10	1.07	.01
KIDLATE	-.16	-.25	-228.38	-.06	-.04
DRUGS	.02	1.67*	1.97	1.57	.00
KIDEARLY	1.40	1.83*	92.04	1.60	.02
HISPANIC	.39	1.01	22.79	.69	.00
THEFT	.00	.18	1.52	.67	.00
HGASPIR2	-.04	-.54	-12.23	-1.59	-.00
WOW	-.04	-2.49**	-6.49	-2.71	-.00
$DISAD	-.00	-.37	-.04	-.06	-.00
AGE	-.12	-1.89*	-13.73	-1.78	-.00
GPA	-.01	-.72	-2.67	-1.23	-.00
SES	-.02	-1.08	-2.00	-1.29	-.00
OFFAVAIL	.75	1.71*	75.87	1.56	.01
DAYAB10	-.01	-.27	1.42	.73	.00
DAYAB11					
CONSTANT	3.70		159.35	.80	.03
R^2	.01				
$\bar{R}^2$	.00				
2 times the Log Likelihood Ratio			37.22		
n	3,242		3,242		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.

TABLE 3C

PREDICTORS OF HIGH SCHOOL DROPOUT:
REGRESSION RESULTS FOR GRADE TWELVE LOW PROBABILITY GROUP

	Ordinary Least Squares Regression		Probit Regression		
Variable	B	t	Maximum Likelihood Estimate	t	Partial Derivatives Evaluated at the Mean
VOCCRED	-.00	-1.40	-.10	-1.21	-.00
BLACK	.63	1.18	21.30	.90	.16
SELF	.01	.28	.86	.74	.01
MEARLY	5.82	2.34**	86.88	1.49	.65
LAW	-.03	-.67	-3.17	-.66	-.02
TIAVAIL	-.16	-.26	-2.68	-.09	-.02
MLATE	-.36	-.49	-32.17	-.74	-.24
FEMALE	-.27	-.69	-13.11	-.67	-.10
KIDLATE	.40	.40	56.47	1.32	.42
DRUGS	.04	1.86*	2.14	2.29**	.02
KIDEARLY	1.67	1.41	58.48	1.57	.44
HISPANIC	.51	.76	37.24	1.25	.28
THEFT	.01	.25	.03	.02	.00
HGASPIR2	-.18	-1.49	-13.20	-2.03**	-.10
WOW	-.08	-2.72**	-4.91	-3.00**	-.04
$DISAD	-.00	-.12	.15	.31	.00
AGE	-.20	-1.57	-13.06	-2.03**	-.10
GPA	-.01	-.19	-1.09	-.65	-.01
SES	-.01	-.34	-.48	-.38	-.00
OFFAVAIL	.06	.08	2.89	.08	.02
DAYAB10	-.01	-.36	1.95	1.38	.01
DAYAB11	.10	3.88**	1.06	1.46	.01
CONSTANT		7.61	197.80	1.19	1.49
R^2		.02			
$\bar{R}^2$		.02			
2 times the Log Likelihood Ratio			50.57		
n	2,636		2,636		

*p < .10
**p < .05
Note: Coefficients and partial derivatives were multiplied by 100.